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Every Day -A Red Letter Day

October 19, 20, 21, 22

Annual Meeting of the

American College of Radiology and Physiotherapy

at Chicago

Some of the men who have kindly consented to appear:

WILLIAM ALLEN PUSEY, M. D., Past President, American Medical Association.
"X-Ray Therapy Twenty Years Ago."

C. H. HAGER, M. D., University of Wisconsin.
"Diathermy in Gynecology and Genito-Urinary Practice."

W. T. BOVIE, Ph. D., Assistant Professor Bio-Physics, Harvard University.
Subject to be Announced.

F. B. GRANGER, M. D., Boston.
"The Treatment of Non-Union or Delayed Union of Bones - and Bursitis."

GUSTAV KOLISCHER, M. D., Chicago.
Subject to be announced.

WILLIAM L. CLARK, M. D., and H. H. BATH, M. D., Philadelphia.
"Electrothermic Methods in Surgery."

DISRAELI KOBAK, M. D., Chicago.
"Observations on Physiotherapy Abroad."

J. C. ELSON, M. D., University of Wisconsin.
Subject to be announced.

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Radiation Methods in the Treatment of Malignancies*

JOHN R. RANSON, B. S., M. D.
Denver, Colorado.

THE early observations of the effects of radium and x rays upon malignancies disclosed a certain specific effect of these agents upon many malignant tissues, in the sense that much smaller doses were required to induce degeneration and disappearance of certain of the malignant tumors than of normal tissues.

Information derived from clinical and experimental sources led to the conclusion that the majority of the malignant tissues were many times more susceptible than normal tissues. Yet this is not entirely borne out in reference to some of the normal body tissues; for instance, we find that the normal tissues, such as the sex cells of the ovary and testis and lymphoid structures, are very susceptible to radiation and that there are very few neoplasms which are as radio-sensitive as these. Therefore, the experienced radiologist learns to take careful account of the susceptibility of the normal tissues so that they may be exposed to radiation as little as possible in the course of treatment, and to vary the dose and the areas radiated accordingly.

There are many local and general bodily conditions which influence the radiation reaction.

In general, the more embryonal the type of cell the greater is its susceptibility. Hence the normal tissues of young infants are much more sensitive to rays than the tissues of adult persons.

The general physical condition and especially the effect of associated pathological conditions must be given more consideration than they have heretofore received. Unnoticed pathological conditions no doubt have caused and are still causing many anomalous results of radiation which disturb and even surprise the operator. Especially in the aged must such associations be looked for and taken into account in calculating the resistance of normal tissues to radiation.

In applying radium to the various malignancies the method of choice is in many cases a problem and one on which hangs success or failure.

It has been determined that by the use of smaller amounts of radium, uniformly distributed, more satisfactory results are being obtained than was experienced with the tubes and large needles. In fact, most large growths can be better treated by the use of three or five milligram needles than with tube containers and the larger needles, for the radiation from the needles can be placed more exactly where it is needed in the zone of active proliferation of the growth.

With the recent organization and establishment in some of our larger cities of the various commercial radium emanation plants, it has brought to every radiologist the possibility of a more acceptable form of application. Radium emanation or radon is being supplied with a complete set of applicators. This has been a great advance and help to the radiologist who does not have access to the large private or municipal emanation plants.

The use of emanation in the treatment of deeply seated malignancies is a rapid advance and has a great advantage over the use of needles in many instances. The most promising methods of treatment of malignant tumors at present are based on the fact that cancer remains during a greater part of its development a local infection, and even the secondary metastatic tumors begin in their respective regions as purely local infections by the growth of a minute group of transplanted cancer cells.

*Read at the Third Annual Meeting of the American College of Radiology and Physiotherapy, Chicago, Nov. 12, 1924.

Therefore, if the radiologist can inhibit or stop the spread or dissemination of the cancer cells he can hope for a cure. By surrounding the infected area with emanation spicules, or radium in other forms, in sufficient quantity so that dissemination and spread is blocked, then the center of the malignant area will take care of itself. That is, in the majority of large tumors the central cells are of such low vitality that they will degenerate completely if the marginal cells are destroyed. Of course the central cells will be cross-fired from all sides if the tumor mass is entirely surrounded in the course of treatment. We should like to emphasize that it is from the margin of the growth that spread takes place and if the margin can be destroyed the center will be taken care of.

Fig. 1—Case No. 1. Radiograph, showing the radium needles inserted about the lesion in the breast and high up in the apex of the axilla in the metastatic glands. Insert—Case No. 1—Inoperable carcinoma of the breast, showing the wires which are attached to the radium needles protruding from puncture wounds where the radium needles were inserted.

In view of this fact it seems reasonable to expect that a great deal may be accomplished by correct methods of purely local treatment.

The success of surgical treatment depends upon the fact that cancer remains localized for a certain period of time. Modern radiation therapy is based on the same fact, that cancer spreads locally and through the regional lymph channels. Radiation seeks to destroy all the cancerous tissue. For this reason, the rule in radiation should be to *treat well beyond the visible and palpable margin of the tumor mass as well as treating the regional lymph glands.* By these methods, based on anatomical and clinical research, better results are obtained than was possible in the treatment by surgery alone

In carcinoma of the lip, the surgical treatment by radiation requires intensive radiation of a much larger area than can be excised by the so-called block dissection. This is accomplished best by the use of the deep therapy x ray. The local lesion is of the least importance and if seen early can easily be eradicated either by local applications of radium or by building what is termed a picket-fence around the growth with radium needles.

In carcinoma of the breast, the mode of procedure should be thorough x ray treatment to include the midline of the body, the supraclavicular region, the axilla and well down beyond the area of involvement. If there are no demonstrable axillary or supraclavicular involvements, the radical removal should be done; but should there be demonstrable axillary or supraclavicular involvement the original tumor should be treated by the implantation of emanation spicules or needles in addition to thorough x radiation. Such cases should be followed up with a second treatment by means of the deep x ray therapy in from three to four months.

In regard to carcinoma of the uterus, the problems presented are almost as numerous as the number of cases seen. Too often we see this condition in the advanced stage. But in any stage the use of radium should be given the first consideration. If the condition is early, whether it be an erosion of the cervix or an early adenocarcinoma of the body of the uterus, radium is applicable and may be followed by the classical Wertheim or a simple hysterectomy, as the case demands. The best result obtained from the use of surgery (Wertheim) in operable cases, gives only one cure out of every four cases operated, ignoring the fact that 50 per cent of the cases were considered inoperable. It is in the 50 per cent of inoperable cases that radiation has been making its greatest headway. By the use of tubes containing radium inserted into the fundus and into the cervix uteri and radium packs into the vagina, we should and are reporting a much higher percentage of cures.

Carcinoma of the prostate should be treated through the open bladder. The reasons for opening the bladder are two-fold: (1) It gives easy access to the tumor and (2) emanation spicules or radium needles may be introduced under the guidance of the eye and finger. This permits suprapubic drainage to be made, for all these cases have a large residual urine and some cystitis. It is impossible in many cases to accurately determine the extent of the infiltration above the prostate by rectal examination, and it is more impossible to accurately place radium when blindly introducing it through the perineum. Therefore, with a good suprapubic exposure one is able to accurately outline the extent of the infiltration and place the radium accordingly. The procedure should be to deliver at least 100 per cent of an epilating skin dose throughout the pelvis and up to the umbilicus by a calculated number of portals of x ray, in addition to the treatment as described above. The perineal method can well be used to supplement the suprapubic procedure.

In carcinoma of the stomach, Dr. Wm. J. Mayo reported 996 cases of which only 344 were operable. Of the 344 cases operated, only 86 or 25 per cent remained cured after five years. In other words, only 9 per cent of the cases of carcinoma of the stomach can be cured by surgery alone.

We are all aware that while carcinoma of the stomach is not one of the most frequent forms of malignancy, yet it accounts for at least one-fifth of all the deaths from cancer.

If with the greatest refinements in surgical technique in the hands of experts only 9 per cent of the cases of gastric carcinoma can be saved, would it not be worth while to apply our modern methods of radiation to this condition instead of considering inoperable cases hopeless, as many of our surgeons are doing?

Radiation therapy in these cases should be considered a radical procedure, more radical even than the surgery indicated. Such therapy will destroy one-fifth of the circulating hemoglobin and blood cells and will usually produce a transient diabetes, but should never be carried to such an extent as to destroy both adrenals.

Can we not urge you to carry out the following procedure: By hospitalization, alkalinization and a proper dietary regime prepare the patient to withstand a severe radiation sickness. Administer up to 90 per cent of an erythema skin dose throughout the area of involvement by cross-firing with well filtered x rays in such a way as to conserve one adrenal. Then as soon as possible following this treatment prepare the patient for laparotomy and introduce into the malignancy a large number of emanation seeds of low intensity, closing the abdomen without drainage.

We believe that the introduction of some such procedure making use of the refinements

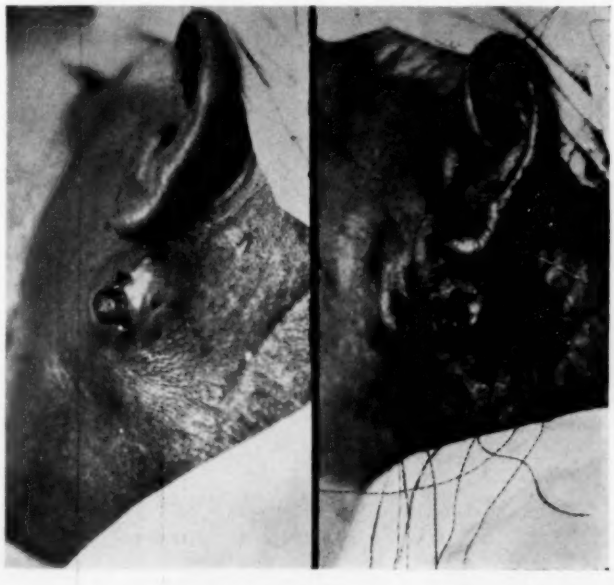

Fig. 2—Case No. 2. Diagnosis of metastatic area in superior cervical region following small carcinoma on the ear.

Fig. 3—Case No. 2. Showing wires protruding from puncture wound where the radium needles were inserted about metastatic area.

of radiation technique will open up a new epoch in the treatment of otherwise hopeless cancers of the gastro-intestinal tract.

DISCUSSION

Dr. H. H. Bowing (Rochester, Minn.): The Doctor referred to the action of the therapeutic rays upon tumor tissue. To my estimation this is most essential if we are going to advance the art of radiotherapy. McCarthy and Broders have definitely shown in untreated cases that if there are certain factors present in the tumor tissue they can predict the number of postoperative months that the patient should live, and this opinion is based upon four factors: (1) The presence of differentiation in the tumor tissue, (2) round cell infiltration, (3) fibrosis, and (4) hyalinization.

It was my privilege to section some four breasts which were considered hopeless and inoperable; in fact, one would say I was wasting time to take them off. Radium was applied to the superficial expressions of the disease. X ray was applied to the metastatic area and in from four to six months the patient's return to general health was markedly improved and the primary lesion greatly reduced in size, and the metastatic lesions were reduced to such an extent that they were not palpable. The surgeons suggested that a radial operation be done. The radiologist and patient were consulted. Operation was decided upon, owing to the fact that these operations have practically no mortality and the patient, therefore, had nothing to lose and practically everything to gain, for if we section the tumor we could tell the patient definitely whether further radiation should be carried on or whether the tumor was sufficiently treated that we could discard further administration.

I like to give radiation therapy in the same way that the surgeon gives his therapy. I want to do something within a definite period of time. If I don't accomplish my purpose within that time I fail just the same as the surgeon fails in his accomplishment.

So these breasts were removed and, on sectioning them, we found in abundance the same facts that McCarthy and Broduers have so well described in nonradiated tissue. The differentiation which was present was not only differentiation to the point of adult tissue formation, but even beyond the formation of adult tissue on into a senile change or a cystic degeneration.

The differentiation is a most intricate subject, and is very difficult to discuss in a few

Fig. 4—Case No. 2. X ray picture (side view) of the radium needles inserted about the metastatic area.
Fig. 5—Case No. 2. X ray picture (antero-posterior view) showing the radium needles inserted in the mass.

minutes' time. All of our text books and all of our teaching leads us to believe that an adenocarcinoma remains so throughout and finishes as an adenocarcinoma, but I wish to take exception to that thought. Personally, we have seen that an adenocarcinoma may start out and form simply an adenoma in a broken fascia—that is, it attempts to form a gland, but it can only go so far and then must begin all over again, trying to form another gland. As we look at such a picture through the microscope we see multiple areas in which there is some attempt of the peripheral cell to differentiate or put architecture in the picture or to do something else, whereas the medullary type of carcinoma is nothing but a mass of cells, rapidly growing, putting no architecture in their tissues at all, resembling an embryonic type of tissue, and if any attempt is made to form a gland there is a differentiated type of tumor. It has been my good fortune to see these glands, these cells, these cancer cells, not only form an adult tissue type, a complete acinous; but after they are complete we have nothing but a cystic wall filled with a necrotic mass. So as I viewed it we saw the transition from a malignant state, through the peripheral cell, the cancer cell, on into a non-malignant state.

Now to consider the other three factors in the tissue that supports the cancer. We may speak of them as defense factors, factors that the patient uses to overcome the presence of the malignant cell, and I liken them to the scaffold that the contractor places up in constructing a building—as soon as it has answered its purpose it is taken down and moved out in the field. So it is with these four factors. The round cell infiltration is made up of mast cells, round cells, leukocytes and a variety of cells rush in, in order to carry on a function. After they have filled their part the tissue becomes fibrotic. The fibroblasts are predominant and are very cellular. Eventually the nuclear material disappears and we have then a very dense fibrotic tissue. As the density

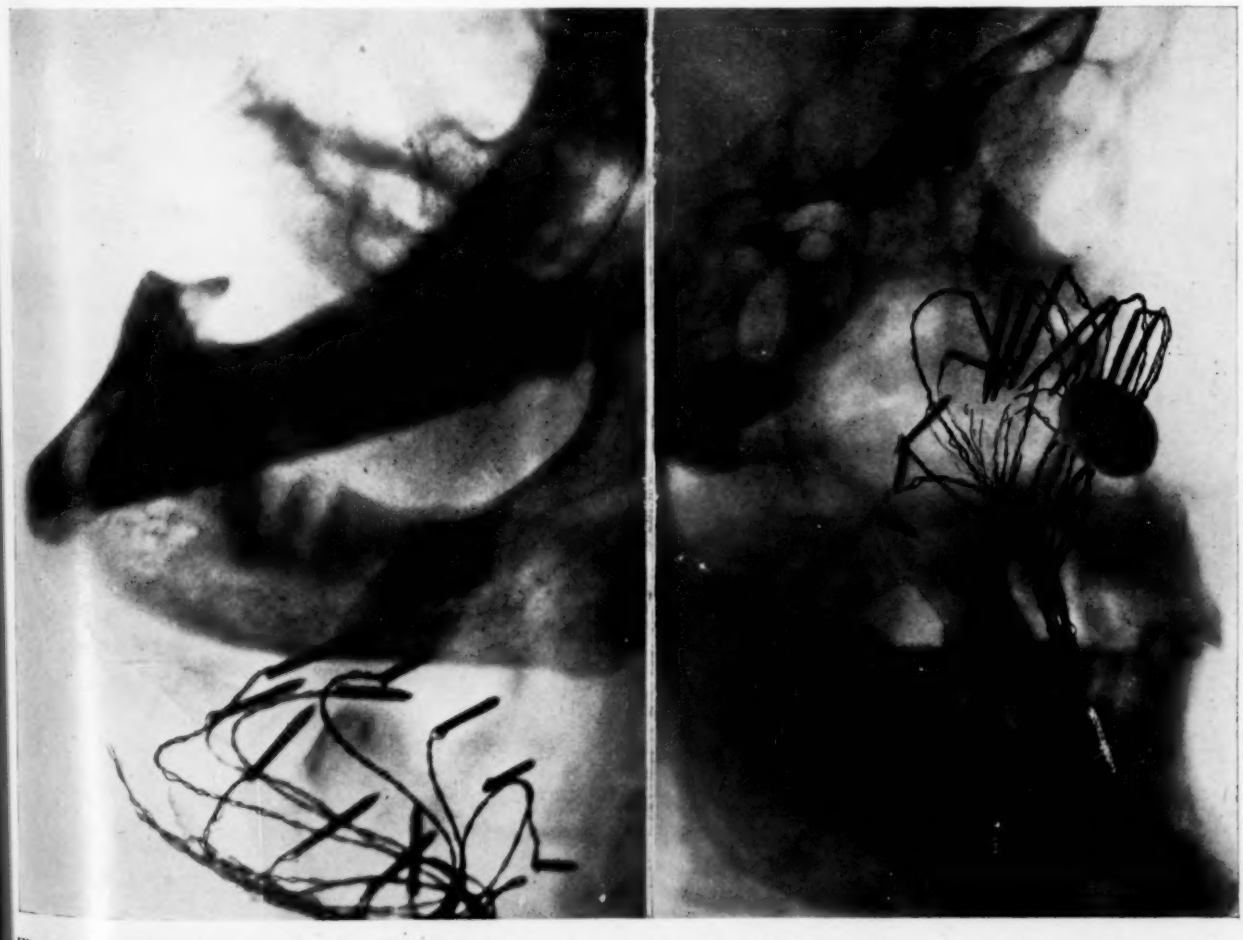

Fig. 6—Case No. 3. Diagnosis of metastatic glands following carcinoma of the lower lip. X ray shows radium needles inserted about the metastatic area in the neck.

Fig. 7—Case No. 4. Diagnosis of carcinoma of cheek. X ray picture shows the insertion of radium needles about the lesion.

increases, the cellular elements disappear and a very thickened material results, which we call hyalin tissue. The hyalin tissue soon passes out of the field and calcium deposits merge into it, so we can see it is definitely a degenerative process, a process that had something to do in the beginning and having completed its work quietly passes out of the field of activity.

Now these four factors, as I say, can be definitely produced at will by administering radium and x rays to tumor tissue, so it seems that we have in our hands a method by which we can imitate nature. The patient is putting up a defense which we cannot estimate, and there is no cellular reaction, no cellular counts by which we can as yet determine the amount of resistance that the patient is putting forth. Until such a time our treatments seem that they must be in a measure imperfect, but we can break our dose, we can apply a small quantity of radium today and apply the same quantity tomorrow, or we can apply two treatments a week. In other words, we can give the entire dose within a period of two weeks, three weeks, four weeks, and so on, leading up to about six weeks—the maximum. Try to do all you can within the six weeks and in that way you can determine the response that the patient is putting forth. It is astonishing to see some tumors diminish 50 per cent in the course of ten days or two weeks with the broken dose of irradiation therapy. As you see the patient respond you can withdraw some of the treatment that was considered necessary in the beginning or you can increase your treatment on those patients that do not respond. In other words, the broken dose method gives us a method or a means of delivering that quantity of radium and x ray which is necessary to bring about a therapeutic result and to my mind is the most essential feature in our therapy.

Question: I would like to ask you if there has been any work done in Rochester by opening the abdomen and planting the irradiation in and around the growth at the pyloric end of the stomach.

Dr. Bowing: Dr. Will recently reported some of his observations at a meeting. I do not know just which one, but he referred to that question.

The stomach surgery as practiced at the Clinic is cleverly done, and the part that they cannot remove I am certain that no radiologist can get by the buried seed technique. It is usually the huge tumor that the seeds are buried into, but you cannot distribute your energy in a large tumor with an eveness that will give you the therapeutic results you want—some areas will be overtreated, other areas will be under treated, and you will find areas between your points in which no treatment at all has been delivered. So the inoperable patients, as we see them at the Clinic, are the ones in which the primary lesion may be small, but there are metastatic areas, glands up around the liver and in the region of the lymphatic distribution of the stomach, and, of course, when the carcinoma has left the primary site I am confident that the surgeon cannot get it; it is a metastasis that is a stumbling block to us all. The type of stomach lesions that I have had a chance to treat, as I say, when the surgeon cannot remove them I am confident that they are pretty widespread, pretty badly disseminated carcinoma and any type of therapy I would apply would be inadequate.

Dr. John R. Ranson (Denver): I just want to thank Dr. Bowing for his thorough discussion of my paper. I want to say one more word about the treatment of inoperable cancers of the stomach.

I agree thoroughly with Dr. Bowing on some of his ideas, but I maintain that in carcinoma of the stomach there are cases that come to the surgeon that are not demonstrable metastasic, where the mass involves vital organs and has spread to an extent that he does not care to attempt to dissect it out, yet when I speak of the application of emanation seeds I don't mean a few, but I mean anywhere from 50 to 75 or even 100. Occasionally it takes that many to absolutely surround that area with these small, tiny seeds, and it can be done very quickly, and it isn't a long procedure. You can usually surround the whole area with these seeds and the cross-fire radiation that you get from the low strength seeds will devitalize or destroy a mass toward the center, and even though it did not, it will cause a fibrosis about the outer edge of it whereby the inner part of the tumor mass will be absolutely strangulated. Then in addition, your deep x ray will take care of the stray cells, as we speak of them, or any mere metastasis in that area.

There is no such thing as giving deep x ray with the small superficial machine; it is out of the question and it cannot be done, but there

are men who are treating cases all over the country, telling their patients that they are giving deep x ray, when the only thing they have in their office is a six or seven inch spark gap machine. This is absolutely wrong and it is getting x ray into disrepute. It is bringing condemnation down upon the heads of the gentlemen who are trying to do real deep x ray therapy.

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Zinc and Mercury Ions in Surgical Tuberculosis*

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IN one respect the surgical world of today presents an inconsistency in its attitude toward the treatment of surgical affections characterized by the existence of a nest of new growth consisting of living organisms. When these parasitic organisms form a deposit in a locality that is capable of surgical removal *in toto*, as in early and still localized cancer, recognition is being slowly accorded the writer's contention first made thirty years ago that a parasitic growth should be destroyed *in situ* instead of being cut out while still living, with the danger of reimplanting the organisms in the freshly cut edges of the wound.

Tuberculosis is now fully recognized as a parasitic disease plus a too willing soil, yet we hear of no effort to recognize its capacity for operative reinfection in those cases admitting of surgical intervention. In other words, forty-three years after Koch's discovery its surgical treatment shows no change—at least no recognition of this auto-infective possibility. And this continues in spite of the further fact that the destruction of a portion of the infected nests may result in a cure of the tuberculosis by increasing the patient's resistance to the remainder of the disease, while this is impossible with cancer.

If this statement of facts is well founded, it is evident that a surgical means is needed by which the bacilli could be devitalized during removal and the absorbents at the edge of the deposit simultaneously sealed.

Such considerations induced the reader of this paper to employ what might be called electrochemical curettage (ionic curettage) as long ago as 1899, in the treatment of persistent and intractable tuberculous abscesses in the neck, with such quick healing and small resultant scars that the patients were exhibited to the members of the Philadelphia County Medical Society in the winter of 1900-1901. Since then some twenty other cases, several in rather a desperate condition, have been subjected to the same treatment. A recent follow-up inquiry into the present condition of these patients has shown that all are well without exception, there having been no relapses or development of other tuberculous conditions.

The simple procedure described when these patients were shown twenty-three years ago is still used without modification. Such excellent time-tested results would seem to commend it to the attention of office practitioners as well as orthopedic surgeons and special workers in tuberculosis. The association of this method with ultra violet treatment would, I believe, do much to empty such hospitals as those for crippled children.

The process, it will be seen, is essentially the same as that employed in electroplating, when silver, for instance, is eroded from a silver anode, passed through the electrolytic solution in ionic form and deposited on the metal object attached to the cathode as metallic silver. The essential difference between the two methods, in addition to the difference in metals used, is that the mercury and zinc ions are not compelled to traverse the whole body to the cathodic pad, but unite at once with the substances of opposite polarity contained in the body fluids and the protein of the cells in contact with the electrode, forming a dead material that is subsequently extruded as a sterile discharge.

The method is, therefore, the devitalization of the infected neoplastic deposit *in situ* by the anodic diffusion of the ions of mercury and zinc. An ordinary galvanic current is used. A zinc probe of a size adapted to the extent of the growth or cavity is amalgamated with quicksilver, connected by a fine wire with the

*Read at the Third Annual Meeting of the American College of Radiology and Physiotherapy in Chicago, Nov. 12, 1924.

anode of the power generator, and passed gently into the cavity after an opening has been made, if there is none already present, and the circuit is completed by a large cathodic pad on a distant skin surface. When the current is turned on, the probe is eroded and the ions of both metals are formed and driven into the tissue in contact with the metal instrument, the tissue appearing whitened as it is devitalized. The micro-organisms of secondary infections, incidentally, are also destroyed by the same sterilizing ions, a purulent discharge being changed at once to a serous one, with which the white, crumbly debris is later extruded from the cavity. Such an application seals the capillaries, lymphatics and lymphatic spaces at the edge of the devitalized tissue for several days, at the end of which time it is repeated and extended if the first application was insufficient to destroy all infected tissues.

It has seemed best, in the limited experience indicated, not to attempt to destroy all infected tissues at once, for these organisms are not malignant, and tri-weekly ionizations with mild, almost painless currents have not only seemed sufficient for the devitalization, but appear to add an additional element of stimulation of the reparative energies of the surrounding tissues. This is inferred from the appearance of both local and general improvement after the first week of treatment and long before the destruction of the whole of the infected tissues. Another advantage in the repeated use of weak currents is that blood vessels seem to be immune to weak doses of these cauterant ions, while tuberculous tissue, being an unusually good conductor, takes most of the current and consequently most of the ions. The treatment of large deposits or abscesses situated in vascular regions may, therefore, be made as bloodless as that of the smallest node in a nonvascular region. The method is equally as effective in eroded bone tissue, but with a deferred separation of the bone sloughs.

During this treatment the general health improves steadily and noticeably. The time required for the cavity to fill in with healthy granulations and heal from the bottom varies from six weeks to several months, according to the gravity of the case, the ionization being made weaker and less frequently as healing progresses.

The technical details of zinc-mercury ionization in surgical tuberculosis have been given elsewhere in full, together with most of the case reports (vide appended bibliography), but I may say that they are within the ready accomplishment of any office practitioner who possesses a good controller and meter for the use of the galvanic current and some facility in their use. The controller and meter are to be used for the smooth and painless turning-on of the required power from either a direct current dynamo of the usual medical voltage or from a battery of dry cells. A 45 volt radio B battery is an excellent source of the power for temporary installation or for portable use. The ionic dosage is a product of the strength of the current and of its duration. The doses employed by myself varied from three to 75 milliamperes for fifteen to thirty minutes, repeated from three times to once a week.

Where sterilization rather than tissue destruction has seemed desirable, the mercury ion has been employed alone, diffused from an amalgamated gold electrode. The elimination of the zinc ion is, however, of real advantage only when a large vessel is close to the tuberculous deposit.

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DISCUSSION

Dr. Omar T. Cruickshank (Pittsburgh): I have followed Dr. Massey's technique for some twenty years with almost uniformly good results. I followed it very carefully and I have gotten very good results with it, and I wish to thank Dr. Massey for his address and especially for developing such a wonderful method. It is very good.

Dr. Leo C. Donnelly (Detroit): I just wish to discuss Dr. Massey's paper from an ultra violet standpoint in saying that I use ionic electricity, following with general ultra violet —that is, where I have a deep seated infection, as commonly seen in the cervix, I use galvanism or ionic medication, and I also use direct electro-coagulation; but for getting into a kidney abscess where there is a kidney mass and I wish to penetrate deeply, I use ionic medication and I use my ultra violet rays.

My feeling is that ultra violet is a wonderful general body uplifter, but for deep sterilization you can do it much better, much quicker, with galvanism than you can with ultra violet. Ultra violet is very good, but I practically always use galvanism for my deep sterilization.

Dr. C. F. Frizelle (Chicago): I have followed Dr. Massey's method of using the mercury on the electrode a great deal and I have gotten wonderful results.

I have found it difficult to find a good galvanic current; a commercial current run through any kind of a rectifier that I have ever handled is hard to make the patient like, and I used batteries for a long time and would like to use them yet if they were not so troublesome to keep in order. I suppose if galvanic outfits sold for a thousand dollars there would be more push behind galvanism than there is, but it is tending to fall into disrepute because it is so easy to get together a galvanic outfit and so hard to keep it going.

Dr. A. F. Tyler (Omaha): I would like to ask Dr. Massey if this method of treatment is used in bone tuberculosis.

Dr. W. Scott Keyting (Salt Lake City): Dr. Massey made the statement that within a few weeks following his application of his mercury and zinc he has a general effect on the systemic reaction of the patient. If his theory that this combination of mercury and zinc is correct, the reason for this reaction is not far to seek, and it is equally applicable in other kinds of abscesses near the surface. There isn't a man here who does not some time in his practice use the autogenous vaccines.

The positive, direct current, using the metals, copper, zinc or mercury, undoubtedly does produce a coagulation of bacteria and this coagulation is produced with some degree of penetration. If the wall of that abscess be a tuberculous abscess or tuberculous sinus or any type of pus, if the wall has broken and the dead organism is permitted to get out into the tissues, your reason for autogenous vaccine is simple enough; the body responds to the invasion of that dead organism by production of an antibody just the same as it would had you injected your autogenous vaccine subcutaneously.

Dr. G. S. Green (Gary, Ill.): I would like to ask Dr. Massey if the direct current generated from the street current is as effective as the chemical current; and I would like to ask him if it is not as effective.

Chairman Curran Pope (Louisville, Ky.): I have been using galvanism practically every day in my practice since 1890. Among the interesting things is the fact that it is with very great difficulty that you can find any commercial house manufacturing a pure zinc electrode, for instance, for intra-uterine work. I make all of my own, and make a great many of my pure copper electrodes, and have designed a shank to hold the intra-uterine zinc and copper that I find very, very satisfactory.

My experience has been that with the decline of the old-fashioned Gaunder cell or the failure to manufacture it, that we lost one of the most effective cells that was ever gotten out for the purpose of galvanism. I cannot but believe that in the use of galvanism today we get a direct chemical current, but we get a direct current that is subject to certain variations or oscillations that are inseparable from the mechanical generation.

I am sure that all of us who have read any of the old and recent literature know that Dr. Massey has for many, many years been an advocate of this kind of treatment within the cervix and within the pelvis. I want to say this, that I have yet to find a treatment along these lines that can in anywise equal the direct current; I believe one who does not use the combined ionization of zinc-and-mercury, and copper-and-mercury for certain conditions of the character that the Doctor has described, has simply robbed himself of a method that is and

has been and, in my opinion, always will hold a unique field in electrotherapeutics.

Dr. G. Betton Massey: I feel gratified at this unanimity of opinion about these methods, but I would like to ask Dr. Cruickshank and Dr. Donnelly to publish some of these results that they are getting; let me have some corroboration. My first paper on this particular question was delivered in 1901; the second one was given in St. Louis in 1904, then the subject was published in a medical journal, and then I have mentioned it in a couple of books, but I have yet to hear *until today* of anybody else using it. Therefore, I am the more gratified at hearing it. I am particularly gratified with Dr. Keyting's explanation of what seems to be a mysterious improvement in these cases.

As far as apparatus is concerned, all you have to do is to buy two little radio B batteries and by connecting in series you get 45 volts. Forty-five volts, with several thousand milliamperes of output, will last just as long or longer for this apparatus than it will for the radio. Let me tell you how to make a temporary controller. Partly fill a shallow glass or porcelain dish with tap water; run a wire from the negative binding post of the battery to one edge of the dish (See Fig.) and have it dip in the water at this edge; then dip the free end of the wire conductor from the dispersing pad into the water at the opposite end of the dish. A little current will then traverse the circuit if the active electrode is in place, but too little to cause shock if the voltage is not great and there is no salt in the water. To increase current gradually move one of the wires closer to the other through the water, or sprinkle a very few grains of common salt in it. Wires should remain wherever placed and not allowed accidental movements. Tinfoil plate contacts with the water instead of wire will increase the volume of the current.

Maximum and Minimum Effects of Autocondensation in High Arterial Tension*

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As a killer of men, cardiovascular disease takes first place. Over 300,000 deaths occur annually in the United States in which vascular tension is a prominent factor; this fact is one over which physicians must ponder seriously.

There can be no disease of the arterial tree without some evidence of its existence being presented by the readings of the sphygmomanometer. The correct interpretation of these readings is a problem, the solution of which is not always an easy matter.

Many terms such as benign, malign, essential, etc., intended to be descriptive, have found their way into blood pressure literature. It is the opinion of the writer that the words benign, malign and essential should be eliminated, as they are meaningless when applied to blood pressure.

The two distinct groups into which cases of high blood pressure may be classified are: *hyperpiesis* and *hypertension*. The word hyperpiesis is applied to cases of high arterial tension *without* discoverable pathology, and hypertension to cases *with* discoverable pathology.

There seems to be more or less confusion among medical men over the question "Is high blood pressure a symptom or a real entity?" The word symptom is usually defined as a token or sign of something. It is that which indicates the existence of something else of which it is the effect. Indisputably a rise in blood pressure is due to something, known or unknown, and may be classified as a symptom, but when the arterial tree presents a pathology nine times out of ten it is the *cause* and not the *effect* of that pathology, and therefore not a symptom.

It is possible, but not probable that hypertension in extremely rare instances should be classified as or considered a symptom. However, hyperpiesis is a symptom of some derangement of the factors concerned in blood pressure. It should be remembered that, as back of all functional disturbances there is an etiology, so there is an etiology back of hyperpiesis. Just where hyperpiesis ends and hy-

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pertension begins is not easy of determination. While there are certain cases that we do not hesitate definitely to classify as hyperpiesis, and certain others as hypertension, there are still more cases that partake of the nature of both. Of this we are assured: Hyperpiesis is a Paul Revere message which should arouse the best within us to combat this scourge of humanity.

Too many physicians still tenaciously cling to the wornout idea that high arterial tension is at best only a symptom of cardiovascular pathology or arteriosclerosis.

In order that high blood pressure can exist at all there must be first a change in blood pressure factors, which are: Cardiac energy, resistance offered to that energy, arterial resiliency, pulse rate, viscosity of the blood, amount of blood, and its rate of flow. As an important factor in derangement of the essentials, peripheral resistance takes first place. The first rise in pressure is not due to arterial degeneration, but to disturbances in function of the vegetative nervous system, causing contraction of the musculature of the arterial walls, and if the cause persists arterial pressure continues for a long time, changes will occur in the blood vessels and heart. The heart takes on hypertrophy to overcome the resistance, and by reason of increased and continued cardiac effort the arterial walls gradually lose their resiliency and blood pressure becomes a definite entity as a factor in causation.

Frequently we see recorded the experiences of physicians with autocondensation in reducing blood pressure, wherein statements are made such as, "In a few cases excellent results are obtained, yet the same treatment in others proved useless or harmful."

Why are there successes, and why are there failures? The answer is: First, wrong diagnosis; second, imperfect understanding of the physics of the high frequency current; third, inefficient apparatus; fourth, bad technique; fifth, insufficient treatment; sixth, trying to do the impossible.

If autocondensation yields brilliant results in hyperpiesis, it does not necessarily follow that equally good results may be obtained in hypertension. Aspirin may relieve a nervous headache and have no effect upon headache from cerebral tumor.

The treatment of high arterial tension by autocondensation without individualization of the patient will prove a dismal failure.

Failure may be due to want of co-operation on the part of the patient. However, the most failures are due to the physician himself.

Unfortunately the idea still prevails in the minds of many physicians that in a patient at the age of 70, a systolic of 170 and a diastolic of 120 is normal for that individual; and that in case such a patient should acquire a systolic pressure of 250 and a diastolic of 160, and the systolic be reduced by autocondensation to 200 and the diastolic to 140, the treatment has been a success. While it is true the treatment has benefited the patient, it has not taken him to safe ground and cannot be classed as a success.

The border line between success and failure is a very loose one. While there are clean cut successes as well as clear cut failures, the results in the majority of cases occupy the ground between the two.

Maximum effects from autocondensation are realized in cases of hyperpiesis. Minimum effects are noted in hypertension. In practically every case of hyperpiesis the pressures can be brought down to normal by autocondensation, and through proper methods of living they may be maintained. A case of high arterial tension in which autocondensation fails to reduce the pressures to normal must belong to the hypertensive group regardless of our failure to recognize a pathologic lesion.

In any case where the systolic pressure cannot be reduced and maintained below 200, or a diastolic cannot be reduced and maintained below 130, the effects of autocondensation, while not an absolute failure, are reduced to the minimum and that such cases exist is experienced by us all.

Often the question is asked: Why do high blood pressure cases with a high pulse pressure respond more readily than the high blood pressure cases with a low pulse pressure? The answer is easy: Pulse pressure is the difference between the systolic and diastolic pressures. With a high systolic and high pulse pressure the diastolic *per se* must be low, and such a case must take its place in the hyperpictic group. With a high systolic and low pulse pressure the diastolic *per se* must be high, and such a case has passed from the

stage of hyperpiesis and entered the stage of hypertension, and has a pathology regardless of our ability to discover it.

To understand the significance of blood pressure readings, first of all a careful family and personal history must be taken, followed by a systematic physical examination. An ophthalmic examination will often yield information that can be had in no other way. A complete laboratory report on renal efficiency and blood components is advisable in all cases.

There should not be overlooked the fact that there is a predisposition or tendency to certain diseases running in families, among which arteriosclerosis, preceded by high arterial tension, takes first place. Whenever the iodides prove of value in the reduction of high blood pressure in arteriosclerosis, nine times out of ten the sclerosis is due either to inherited or acquired syphilis.

Why does Dr. Brown succeed, and why does Dr. Jones fail with autocondensation?

Dr. Brown succeeds because he makes a careful examination of his patient, from which he visualizes the actual condition of his patient's cardiovascular system. He uses a sphygmomanometer that registers accurately. He is familiar with the best method of taking blood pressures. He is able to properly interpret the readings of the meter. He uses an efficient machine and is familiar with its effect under varied circumstances. He is well grounded in the physics of high frequency currents. He uses a couch pad with a thick dialectric. He treats his patients as individuals instead of cases. He does not apply autocondensation because he has heard that it is the ideal treatment for high blood pressure. He thinks things through to their final and logical outcome. He recognizes that there is no set formula for application of autocondensation. He knows when to administer heavy and when to administer light doses. He knows the approximate time that should be consumed in treatment of each individual patient. He knows the different effects of autocondensation and indirect diathermy. He knows that autocondensation should not be given within two hours after a meal. He knows that the treatment should not be pushed until there is aching in the wrists or queer feelings in the head. He is able to approximate the time which should elapse between treatments. He knows that an obese patient requires different technique than a thin, desiccated one. He knows that vibration or monopolar application of the high frequency current to the spine neutralizes the good effects of autocondensation. He knows when and when not to apply diathermy to the heart. He knows when autocondensation should be alternated with diathermy in a case of hypertension with kidney complications.

He knows better than to starve a patient with high arterial tension. He knows that in most cases a limited amount of animal protein benefits his patients with hyperpiesia. He knows that salt is not contra-indicated except in water-logged patients with cardiac decompensation. He knows that he should generalize the disease and individualize the patient, and he knows when autocondensation should be assisted by other measures. As a summary Dr. Brown is a formidable man with an idea and knows how to put it into practice.

Dr. Jones fails first of all because he is likely not to thoroughly examine his patients. He does not recognize the difference between pseudo and real high frequency currents. He probably uses inferior apparatus. He may not know the difference between a thundering-lightning cabinet and a real high frequency machine. He does not discriminate between hyperpiesis and hypertension and gives enormous doses to both. He fails to recognize that aged are frail and do not respond well to electric currents. He has the idea that a patient should sweat in order to obtain best results from autocondensation. He employs a chair pad dialectric. He thinks that because autocondensation reduces the pressure in one case it should in another. Dr. Jones has tried autocondensation for high arterial tension and found it wanting, having lost not only the meat from the bone, but the bone itself. He rushes into print with a breezy article condemning high frequency currents in general and autocondensation in particular. These deprecations are common to hear, but scarcely worthy of our attention. However, it may be something of a damper for Dr. Jones to be told that he is on a fruitless errand.

The sad thing of it all is that there are too many Drs. Jones and too few Drs. Brown.

The indispensable foundation of successful work in physiotherapy or any other line of human endeavor is a solid underpinning of fundamental tenets, and victory is to be attained only by those who intently seek it.

In conclusion, permit me to note that it is a profound and refreshing satisfaction to have a

reasonable confidence in the success of autocondensation as a remedy for high arterial tension.

DISCUSSION

Dr. G. B. Massey (Philadelphia): I feel that but little can be added to the many valuable suggestions of this paper, and I would not arise but for an experience some years ago with an aged man whom I placed under this treatment, only to have him get worse. He was probably almost dying at the time. The result of several autocondensations of the best kind was to very gradually reduce his vitality. He left. I heard afterwards that a postmortem showed his bowels were loaded with feces.

Since then I have refrained, of course, from using this method in the aged. I had not come across the doctor's statement and other probable statements on that point, but I have used active measures that I do not think were stressed enough in the doctor's paper about keeping the bowels moving in these people, especially the older ones. We don't know what the cause of this hypertension is, but it is possible that one of the causes of hyperpiesis is toxins from stasis of the lower bowels, and now that we have that wonderful wave machine that you all know about for the treatment of stasis we have a weapon for that condition.

A dentist who came to me with a moderate amount of hypertension and even a little albumin in his urine, revealed decided evidence of autotoxemia, so I gave that man doses of a teaspoonful of beta-naphtholate of bismuth. Now I believe some people use that in three grain doses. It is perfectly harmless in the intestine. It was originally imported from Germany under the name of orphol, but now is made by several firms in this country. In suspension, a liberal dose given on an empty stomach will do wonders for this toxemia.

But there are two other remedies I want to mention to supplement our physiotherapy. This that I have just mentioned I give once a day, either at bedtime or a half hour before breakfast. That may be mixed up in strength, say about an ounce to four ounces; an ounce to one ounce of elixir, the rest in water, shaking before taking a teaspoonful to a tablespoonful.

Now you will probably laugh when I mention one of the other remedies that I am using more nowadays. I was reminded of the simplicity of it by a Jewish gentleman whom I hadn't seen for some years, and when I recommended it he said, "Oh, yes, I see you use cheap medicine." This is mustard seed. It is cheap, but it is 3,000 years old as a remedy for stasis. Read the old works of Alfred Tyler and you will see he recommended whole mustard seed on the top of your dinner, to be taken at the dinner table, swallowed whole, one or two teaspoonfuls once a day, I believe. He recommended it for what we call stasis and for delicate digestion or constipation. It is better to procure mustard seed from a wholesale grocer, for it is fresher than that which you get at a drug store.

The other thing that I sometimes use is bacillus milk in those cases. I happen to have a culture that I give away to patients and instruct them to make it themselves. This is absolutely noncommercial. I do not like to talk about it, because your patients cannot get it unless you give the culture to them and instruct them pertaining to its preparation. Have them drink at least fourteen ounces of this twenty-four hour bacillus milk before meals every day. I believe that bacillus milk is inimical to the colon bacillus.

Finally I want to tell about the results in another 82-year-old patient who was not a patient of mine, just an acquaintance, who came to visit me. She was an old Civil War doctor, 82 years old, very delicate and yet very spry, who had been under medicinal treatment for a moderate amount of hypertension, off and on, for several years. I put her on the bacillus milk and the mustard seed, not the other, for she was complaining only of hypertension and the dizziness from it. As a result of about six weeks of this therapy her blood pressure went down from 260 to 180.

Dr. Leo C. Donnelly (Detroit): I am one of the doctors who believe that Dr. Grover is about the best authority on autocondensation that exists, and if it wouldn't be below the dignity of this organization I wish he would consider us all medical students and instruct us as to when we should use autocondensation and why, in what cases we should sweat the patient and when we shouldn't, touch on autocondensation in certain cases like hyperiesis, citing some of the general cases.

In other words, all he told us was wonderful if you knew considerable about it, but if you

did not know a lot about it he did not help you very much.

Chairman Curran Pope: Dr. Grover strikes the keynote of the whole situation when he says that you must know your patient. Now in the hospital and clinic that I run we do not allow a single treatment to be given until we not only have examined the patient in every possibile way, but have made a careful diagnostic summary of the major conditions and the minor conditions that are present in his case. These demand consideration and thought from the medical director, who happens to be your humble servant.

I think that if every doctor could have constantly in his mind and in his medico-pathologic vision one line of Shakespeare, he would come much less near making mistakes than are made, and that line is, "This effect defective comes by cause." Keep that always in front of you, never forget it, and I think many and many a time when you are ready to name something without a pathologic basis you should first *call* yourself down, and you will be very much less likely to *fall* down.

Another thing about the bacillus acidophilus milk. We have been making this milk in our laboratory now for a number of years. I have swapped specimens with everyone that I could, and I will say this to you, that in a reasonable time any culture will run out. You will have to reculture and you will have to start fresh.

In the next place, we do not want a bacillus acidophilus that is inimical to the colon bacillus. The colon bacillus is the chameleon of the intestinal tract, and he changes his color and his activity to suit the bacteria that is present. If we have putrefactive changes present, then the colon bacillus takes on the putrefactive character. If, however, we have an acid intestine with the predominance or an equal number of the acid bacteria, we then have a colon bacillus that is reinforcing the activity of the aciduric bacillus, so that we gain from the colon bacillus a very great help if we can only bring about a condition of normal bacteria activity. But that isn't enough, we must bring about in addition to the bacterial activity a proper muscular state. This thing of saying that one has autointoxication and that there is absorption of toxins from the colon—the party has not given that individual in many instances a very careful and persistent study. With us this includes over seven or eight days of radiologic study. At the same time, when one has not introduced the colonoscope, has not studied the feces, has not studied the question of the production of toxins that you can find out by culturing them, has not studied the urine with the question of endocrine and other conditions present, then I say no man can sit up here and say he has or has not an intestinal toxemia present. I say to you very frankly that I never make that kind of a diagnosis until I have gone through all that trouble, all that study, only to arrive at that kind of a diagnosis, because I wish to be able to say that this defective condition comes by cause; and until I have reasonably assured myself that I have at least tried by every known measure to find the cause for it, no such diagnosis is made.

Dr. B. B. Grover (Colorado Springs): This question of high arterial tension is a very broad one. This paper was only intended to cover just one little point, and to go into the etiology of the high arterial tension is to go into the practically unknown.

There are many things that enter into the etiology and it might be said that endotoxins is one of them and probably the most direct one, but there are so many things that may influence the nervous system which has control over the arterial system that we soon get into very deep water. For me to answer Dr. Donnelly's request is impossible in a few minutes' time. To answer what he has requested would take all day.

In considering the question of where and where not to apply autocondensation, you first should do what Dr. Pope has suggested. I do not know those things as thoroughly as he does, for the simple reason that he has a hospital and I have not; but I have a very good laboratory which covers the ground quite well and I turn the case over to that laboratory and take their report.

To put your finger upon any one thing, and especially autocondensation, and say, "That's it," is impossible.

I think the first thing that causes an increase in arterial tension is some effect upon the nervous system, and it is probably some poisonous effect. I do not believe that we have to have an absolute diagnosis of autointoxication to say that that is a probable cause.

I believe that in splitting up of the protein molecule in the digestive process, if it is somewhat interfered with, whether it produces pu-

trefaction or not, it becomes an irritant to the pressor nerve fibre. Before you can have a rise in arterial tension you must have an irritation of the pressor nerve fibre, and that condition may exist over a term of years and the patient have a high blood pressure. We can use all the laboratory methods that we know and we are then unable to discover any pathologic condition. However, it may be probable that one exists whether we are able to discover it or not, but I think that this irritation through the pressor nerve fibre that exists for years precedes all of this.

I do not believe that arteriosclerosis produces high arterial tension; I do not believe that nephritis causes high arterial tension; I think that those things come from inheritance in the first place. You go into a hardware store to purchase some hose; he will have half a dozen different varieties of hose; some of it he will sell you for ten cents, some for twelve cents and some for fifteen cents, and on up, according to the quality of the hose. The quality of your arteria is due to inheritance. If you inherit a good quality of arteria, they will last you for three score and ten years, and if you inherit a cheap variety of arteria, they are going to degenerate and you are going to have trouble perhaps before you reach the age of forty.

There are so many horns to this great dilemma that it is impossible to cover the ground.

If you will ask me any one particular question that I am able to answer, I will either answer it or say I don't know. I long ago learned to say, "I don't know."

Physiotherapy and High Blood Pressure*

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THE tendency to excessive enthusiasm about something that looks good is a trait of human nature from which not even the medical profession is exempt. We find a good deal of it in the physiotherapeutic field. A modality is found useful in a certain condition; and, thereafter, it is applied enthusiastically to anything that bears it any resemblance, without careful analysis of pathology or therapeutic action. Naturally, many of these efforts result in failure; and the failures bring physiotherapy as a whole into disrepute. Manifestly, it is unfair to lay at the door of physiotherapy failures that are due to wrong application or incorrect technique.

Among the conditions that have been responsible for such disappointing experiences is high blood pressure. There are some cases of high blood pressure which respond remarkably well to treatment with the high frequency discharge (autocondensation), and others which respond poorly or not at all. Instead of feeling elated when we have a satisfactory case and depressed when we have a failure, it will get us much further along the road to therapeutic success, to analyze the question of high blood pressure with respect to causes, and to effects of high frequency therapy on these cases.

Modern views recognize four distinct causes as lying at the basis of the clinical condition of high blood pressure. These fall into two general groups: the organic causes, comprising arteriosclerosis, organic heart disease, and nephritis; and the functional causes, which include the so-called idiopathic or neuropathic forms of hypertension.

When arteriosclerosis exists, the blood pressure is high because of the excessive peripheral resistance. The hardened and narrowed arteries restrict the blood flowing to the capillary areas; and in order to provide proper nourishment for these peripheral portions, the heart is compelled to maintain the blood under a high pressure. The high blood pressure is a compensatory expedient on the part of the body. It will, therefore, be readily understood that it is not possible for any clinical measure to lower the blood pressure without endangering health or even life. There is no way of relieving the arteriosclerosis or of lessening the peripheral resistance; and to lower the blood pressure in the face of this resistance would result in depriving peripheral areas of their blood supply, and causing ischemia, local degeneration or gangrene. Autocondensation could hardly be considered as a routine meas-

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ure for the treatment of such cases. Treatment should be directed first, toward the factors which are causing the arteriosclerosis, and second toward securing a hygienic regime for the individual which will minimize for him the danger from vascular accidents, and make him comfortable.

Much the same therapeutic indications hold in high blood pressure which is caused by organic heart disease. To compensate for some local defect, as an incompetent valve or an obstruction to the pulmonary circulation, the heart is compelled to put out the blood at a high pressure, which, of course, is obtained throughout the entire vascular system. Lowering the pressure would result in an insufficient blood supply to tissues which require it; the results would be the same as those consequent upon cardiac insufficiency.

In nephritic hypertension, the increased pressure is due to the action of the retained or uneliminated toxic products. Whether the toxic substances have a specific vasoconstrictor effect or whether the vasoconstriction is compensatory in the effort to send a larger volume of blood through the kidneys in a given time, has not as yet been clearly determined. We do know, however, that whatever assists in eliminating these toxic bodies also results in a lowering of the blood pressure. In this condition, autocondensation is very useful, not to lower blood pressure directly, but to promote elimination. In the course of a prolonged application of autocondensation, the entire body is raised in temperature. In order to maintain thermic equilibrium the excess heat must be carried to the surface by means of water and dissipated by the evaporation of this water from the surface. The water carried the toxins with it to the surface of the body, and thus lifts some of the load from the kidneys and frees the body from an excess of effete products. There is not necessarily any immediate fall in blood pressure; but a fall will take place gradually, as elimination is established by this method.

In the idiopathic or neurotic form of hypertension careful physical examination reveals no organic cause for the increased pressure; but there is always a history of either excessive nervous strain or excessive physical strain. It is in this form of high blood pressure that treatment with the high frequency discharge in the form of autocondensation succeeds in lowering the pressure more or less permanently. This is known as an observed fact, and whatever explanation we adopt must be made to fit it.

The hypothesis that is now accepted is that the hypertension is due to excitation of the sympathetic division of the autonomic nervous system. The sympathetic system is that part of our automatic machinery that comes into play when we are confronted by an emergency, or by a situation in which quick and intense action is necessary; it prepares our body for action. Originally, in the course of our development, the stimulus was anger, hunger or fear; it mobilized our physical resources for the fight or the hunt. Modern life is no less a strain and a fight than was the life of our primitive ancestor living in the woods, surrounded by hostile beasts, and dependent on intense exertion for his food and his life; we have in our lives quite as much fear and quite as much conflict. The struggle for an adequate income, for position and power, business competition, politics, courts, all these excite our sympathetic nervous system and arouse the same physical states in the body as did the hunted quarry or the enemy in war aroused in our primitive ancestor. Adrenalin is mobilized, the visceral capillary field is deprived of most of its blood, which goes to the dilated vessels of the skeletal muscles, sugar is liberated from the glycogen stores in the liver and the blood pressure is raised.

The fighter under modern methods, however, is denied the opportunity of expending physically the energy which the excitement has mobilized. He is all keyed up for a fight, but the big muscles must remain passive; no relief is forthcoming, such as came to the savage ancestor in war and the chase. The effect lasts; the excited condition of the sympathetic system becomes chronic; the blood pressure remains high. The chronically excited condition of the sympathetic system finds different external forms of expression in different individuals, depending upon the character of their fundamental organization. Thus, in some individuals the high blood sugar content may remain as the dominant factor, expressing itself as diabetes; in other hyperchlorhydria and spasm of gastric musculature persists; in a large proportion, a high blood pressure is the final result.

As we have already stated that autocondensation does relieve this condition, is an observed fact. Why it does so, and how, is

still to a large extent a matter of hypothesis. One factor in the production of the lowered blood pressure is the production of vasomotor relaxation throughout the body, increasing the capacity of vessels; and this is probably a result of the heating of the entire body, produced in the same way that relaxation of precapillary vessels is produced in a local area by hot applications. That there is some direct effect on the nervous system is supported by two facts. First, the local application of the high frequency discharge produces a partial anesthesia, probably through a direct sedative effect on nerve endings, and the vasomotor relaxation gives us reason to believe that the sedative effect on motor endings resembles that on the sensory endings. Second, this sedative effect on the nervous system seems to be registered by the consciousness; patients report that they feel relaxed and quieted, and not infrequently fall asleep under the treatment. This sedative effect, therefore, operates on the sympathetic division along with the rest, quieting the excited state which maintains a high blood pressure. Our whole knowledge of the effect of the high frequency discharge on the cells and functions of the body is still in a very nebulous state; and the coming decade will probably enrich our literature with many observations on the subject.

A few words may be devoted to the technique of application of the high frequency discharge in the treatment for hypertension. I have heard some hair-splitting discussions as to the terminology in this field. One worker insists that autocondensation is only the arrangement in which the patient is on the pad and holds the handle in his hands, and that if a plate electrode is put on his chest it must now be called indirect diathermy; and that if the discharge is allowed to proceed from electrodes in the hands to electrodes in the feet it is now direct diathermy. I can see no difference, either in theory or in practice, in these different arrangements. Clinically, the same effect is obtained in all of them; and theoretically they all amount to the production of a high frequency discharge throughout the entire body, whether it comes directly through contact electrodes or whether it is induced through a dialectric, as in the case of the autocondensation pad. My opinion is, therefore, that the exact method of connecting up the patient makes very little difference.

The current intensity must be low. On the average 500 to 600 milliamperes is sufficiently high intensity and more is apt to raise the blood pressure than to lower it. The patient should take copious drinks of water just preceding the treatment. In cases where the object of the treatment is elimination this is indispensable to the success of the method. It is also advisable that the patient lie quiet for a half an hour following the treatment; the lowering of the blood pressure is more lasting if this is done than if he gets on his feet and becomes active at once.

It will be seen that the general rule applying to all therapeutic methods—that treatment must be preceded by careful, thorough and complete diagnosis—finds no exception in the physiotherapeutic treatment of hypertension. By diagnosis we mean not so much the tagging of the patient with the name of a disease, as with a survey of the conditions in which his anatomy and physiology is found. The examination, therefore, is the doctor's real job; when this is done he can turn the treatment over to a technician.

Roentgen Ray Treatment of Hypertrophied and Infected Tonsils*

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IN treating hypertrophy and infection of the tonsil with the x rays, advantage is taken of the effect of the x ray on lymphoid tissue. Lymphoid tissue of the body can be destroyed in whole or in part without appreciable damage to the surrounding tissues.

ANATOMY

Have the tonsils enough lymphoid tissue to warrant the use of the x rays?

"The faucial tonsil is a globular mass of lymphoid tissue lying, one on either side of the fauces, in a recess (the sinus tonsillaris), which

is formed by the palatal arches. It is the largest of the lymphoid nodules of the respiratory and alimentary tracts and differs from such other nodules only in its size, its compactness and in the extent and complexity of its crypts. It may be nearly spherical in shape, though it is usually much greater in its longitudinal than in its antero-posterior diameter and is somewhat compressed from within outward. It has an internal and external surface, an anterior and a posterior border, and a superior and an inferior pole. It is originally developed in two lobes, a lower and an upper, which become fused shortly before birth. Their line of demarcation may often be seen after the full development of the organ. It is attached to the walls of the sinus by a root which includes a variable portion of its outer surface and of its anterior and posterior borders. This attached surface is covered by a fibrous membrane, the capsule, which is continuous with the fibrous mucosa of the surrounding mucous membrane. From its inner surface there extends a series of fibrous trabeculae which divide the tonsil into lobes. All other surfaces of the tonsil are covered by epithelium. It presents on its epithelial surface the openings of from ten to twenty pits or crypts, which extend deeply into its substance practically as far as the capsule.

"The crypts may be single and without a noticeable change in calibre throughout their length; or they may be extensively branched and their calibre much greater below the surface than their faucial openings would indicate. Their walls are normally in apposition; yet the accumulation of cellular debris within them is so frequent that a mild degree of the irregular pocketing that results cannot be considered abnormal. The crypts extend in a general outward direction; those that empty into the supratonsillar fossa extend downward and outward. These latter drain poorly, both on account of their direction and because of the closed condition of the fossa. The same is also true of the crypts that empty behind the plica triangularis."

From the foregoing it is easily understood that in hypertrophy of the tonsils the walls of the lacunae or crypts are compressed and their outlet is obstructed. If not wholly obstructed the mucous and inflammatory material are poured into the follicles and distend them, often showing as white plugs protruding from the crypts. Acute blocking of the follicles by infection and inflammatory materials may result in abscess or quinsy. If a more gradual, subacute or chronic inflammation exists, an increased thickened condition of the adenoid tissue of the crypts results in chronic hypertrophy. In chronic infection with chronic hypertrophy, the size of the tonsils may increase until they lie against the uvula.

TREATMENT

The treatment indicated is drainage by opening up the crypts, either surgically or by lessening the thickened lymphoid tissue in the walls of the crypts. Since the x ray will destroy the lymphoid tissue in part or entirely, it is plain that with proper treatment enough of the redundent lymphoid structure can be destroyed and the outlet of the crypts reestablished without destroying the entire tonsil. Clinically, this can be done. The technique commonly employed may be generalized as: Spark gap 8 inches, kv. 74, ma. 5, filter 6, distance 13 inches, time thirty to forty minutes.

CLASSIFICATION

For convenience of discussion I will classify hypertrophied and infected tonsils into three types:

First—The acutely infected and inflamed tonsil with acute secondary local infection in other parts of the body, as in acute arthritis.

Second—The subacute or chronically hypertrophied and infected tonsil of the child or young adult.

Third—The chronically infected tonsil of the adult with recurring acute exacerbations, as in suppurative tonsillitis.

CASE REPORTS

CASE NO. 1: In May, 1914, I treated a case of the first type, a child of 11 years. She was confined to her bed with acute tonsillitis, which had lasted about seven days. She was suffering greatly with acute articular rheumatism —pain in first one joint and then another. Both tonsils were acutely inflamed and greatly enlarged. The mucous membrane of the tonsils and pharynx was hyperemic and very tender.

On May 15th she was brought to my office and given an exposure to each tonsil.

On May 19th she was given a second treatment. At this time she rested much easier. The tonsils were much reduced in size and the

greatly reddened hyperemic condition of the mucosa had very greatly subsided and she could now swallow easily. Pain in her inflamed joints was markedly less. The trip to and from the office did not cause pain (it did at first), and although she was able to sit up she was carried in and out of my office much more willingly than at first.

On May 22nd she walked into my office without pain and was given a third exposure. The tonsils were nearly normal in size and the mucous membrane normal in color. She no longer complained of soreness of throat or of joints. No further x ray treatments were given and she returned to school within a few days. She has remained well since.

The foregoing type of case, as you all know, generally suffers for weeks instead of days, and as so often happens in acute tonsillitis, the child is attacked with endocarditis and is usually crippled, physically, for life.

CASE NO. 2: In 1914 I treated the first case of the second type—a boy of 12 years who lived in the country and could not come regularly for treatment. The tonsils were so enlarged that they touched the soft palate on either side. By pressure, cheesy material could be pressed from the crypts of the tonsils. The tonsils were not tender to pressure. The child was mentally dull. His mother stated that he did not get along well at school, and at home he always complained of being tired and suffered more or less with "growing pains." Twenty treatments were given. At the end of this time his tonsils had atrophied to normal size, systemic conditions were entirely relieved and he has remained well since.

CASE NO. 3: The first case of type three I treated in 1915. The patient was a married woman, 30 years old, and who had chronically enlarged, infected tonsils. She was subject to recurring attacks of suppurative tonsillitis about every four to six months. About two weeks after an attack of acute suppurative tonsillitis she was given her first treatment. This was repeated every three to four days until ten treatments were given. We waited one month and gave one more treatment, at which time her tonsils seemed to be in a normal condition.

CASE NO. 4: A more recent case of the second type is a boy of eight, upon whom treatment was begun in October, 1921. His chief complaints were blinking of the eyelids, jerking of the right shoulder and right leg and sleeping with his mouth open. He stumbled very easily and was very peevish. Physical examination revealed both tonsils enlarged. From the crypts of the right tonsil protruded a plug of cheesy material. The mucous membrane of the right tonsil was very red and inflamed. The left tonsil was greatly enlarged. The mucosa was very red and inflamed. The lymphoid glands of throat were markedly enlarged. Digital examination of the upper posterior pharynx revealed the posterior nares free from adenoids, but the lymph glands of left side of upper part of pharynx were enlarged and bled on examination. The blood count revealed:

Hemoglobin	70 per cent
Red cells	5,984,000
White cells	11,500

A diagnosis of chronically hypertrophied and infected tonsils was made.

X ray treatment was begun on October 21, 1921. The first thirty-two days after the first course of treatment his improvement was rapid. His lassitude, mental dullness, choreic condition and general health improved rapidly. His tonsils atrophied very rapidly, but did not quite reach a normal condition. This case was kept under observation for a period of seven months, during which time he received 19 treatments. At the end of this time he was entirely well and has remained so up to the present time.

This case illustrates particularly well the rapid shrinking of the tonsils for a period of about thirty days following the first course of treatment, although they were not reduced to normal size as is the condition in most cases I have treated. It also illustrates the necessity of subsequent treatments of from four to five week intervals over a period of from four to six months in order to be sure that the tonsils are left in a normal healthy condition.

CASE NO. 5: A case of chronically hypertrophied and infected tonsils with recurring exacerbations in the young adult came for treatment on August 23, 1921. His chief complaint was sore throat and general rheumatic pains in his muscles and joints. The present attack commenced August 9th. Two weeks previous to this he had an attack of acute tonsillitis. Both tonsils were badly inflamed and greatly enlarged. The entire throat was very sore. Two years previous to this he had an attack of quinsy. The supratonsillar fossa

was lanced twice. Three years previous he had had an attack of tonsillitis, but his tonsils did not suppurate. Since July, 1919, he has had frequent light attacks of pain in his knee joints, back, shoulders and chest.

Physical examination of his throat revealed both tonsils greatly enlarged. Both were badly inflamed and very tender. Cheesy material was readily pressed from the crypts. Blood examination revealed:

Red cells 4,500,000
White cells 12,000

In all, this patient was given 14 treatments over a period of three and one-half months, at the end of which time his tonsils were quite normal and his rheumatic pains had disappeared. He stated that he felt better than he had for several years.

CASE NO. 6: The fourth type of tonsil that has presented itself for treatment during the last twelve months is the young child who has one tonsil or both hypertrophied but not infected. This type of tonsil is first noticed by the school nurse. The child is given a note to his or her parents stating that the child has enlarged tonsils and often with the advice to the parents that the child's tonsils should be operated. This simple hypertrophied tonsil is an ideal condition for satisfactory x ray treatment.

A case of this type came to the writer on September 5th, 1923. No clinical symptoms were complained of. On examination no evidence of disease was found except enlarged tonsils with normal pale mucous membrane. Nothing could be pressed from the crypts of the tonsils and the tonsils were not tender. This child was successfully given x ray treatments.

SUMMARY

The foregoing cases illustrate the different types of the simple hypertrophied tonsil and the hypertrophied tonsil with infection that are commonly seen.

The results during the past nine years of treatment for these types have been satisfactory to both the patient and to the doctor. Therefore:

1. It is a treatment that is not followed with any unfavorable sequelae.
2. It is a treatment that gives no pain.
3. It is a treatment that is attended with as uniform relief of symptoms as any other form of treatment.

And in closing may I ask, Why not give our clientele the painless and safe method of treatment?

DISCUSSION

W. N. Moffett, M. D. (Dike, Iowa): I would like to ask concerning dosage. I have x rayed tonsils for one year and have uniformly received excellent results. The children who have been obliged to stay away from school from one to two weeks on account of getting feet wet have been able to go without missing a day.

J. D. Gibson, M. D. (Denver, Colo.): I have enjoyed this paper very much indeed. Most of us have been treating tonsils for the last two or three yearrs. Dr. Ross goes back a little farther than anybody I know of in treating tonsils with x ray. I believe he gave the year 1914.

We have all had good results. The point we must not lose sight of in this condition is that the x ray is capable of relieving and curing inflammatory conditions. The x ray will cure these inflamed septic tonsils, and also hypertrophied and enlarged tonsils without infection. If it will relieve these conditions, why aren't there a great many other conditions it will relieve—not only active inflammation, but the low grade inflammations with which we come in contact daily in our work, as tuberculosis? If we can have ocular demonstrations of the power of the x ray to relieve inflammations and congestions and infections in these cases, why won't it relieve them in any region to which you can get the proper dose for the condition which you are treating, located correctly and properly in any part of the body?

While speaking of curing tonsils, which we know it will do, think about all these other conditions and treat them with x ray if they can be considered in the same category.

I would like to ask the Doctor to explain his technique in treating adenoids. I do not think of any manner by which this can be done readily.

Some of us are not familiar with the method of treating even the regular tonsil, and the technique I think is quite important just now. Many of us are just in the kindergarten stage, and what may seem simple to some of these folks who have been in this field of work some time is interesting to us. We do not know what kind of an x ray tube is used and how it is placed. We will be disappointed if we do not hear about it.

F. W. Shaffer, M. D. (Salina, Kan.): I would like to know the method of charging such patients.

J. D. Gibson, M. D. (Salina, Kan.): How do you get both the pharyngeal and faucial tonsils at the same time?

W. L. Ross, M. D. (Omaha, Nebr.): I can treat the faucial and pharyngeal tonsil at one and the same sitting by my patient lying on the table and with the tube suspended above I can vary its position more easily than I can the position of the patient. Ordinarily my first treatment is given with the patient lying on the table with a wooden pillow at 45° angle, the head falling over the pillow and turned in such a manner that I strike the tonsil at an angle so that the upper edge of the brass cone strikes about the external meatus. By shooting it backwards and upwards I catch the pharyngeal tonsil at the same time I catch the faucial tonsil.

The next time she will lie on the abdomen and I radiate the lingual tonsil. I reverse it —first on the back, then on the abdomen. While I am getting the faucial tonsil, which is the largest mass of lymphoid tissue in the tract, I give a treatment each time, and to the pharyngeal tonsil every other time.

Treat any enlarged lymphoid nodule in the throat. When it is large enough for you to see it is pathological. If you look into a throat that is normal you cannot see those nodules standing out full, large, red and inflamed.

Ordinarily the focal distance is about ten inches. You will have to learn how to get your patient to drop his shoulder out of position when he is tilted on his back or face. If the position is right you can get within ten inches very easily.

One other point to be mentioned is that we should learn to differentiate between the pedunculated tonsil and the buried tonsil. As the school nurses are picking them out, they are liable to mistake the pedunculated, which sticks out into the throat, with the buried, which does not show much unless you gag your patient. Those buried tonsils are generally larger than the pedunculated tonsils. This must be taken into consideration.

In bringing this before a medical society of general practitioners and surgeons, they often get the idea that you shrivel the tonsil all to pieces. I try to show that by the x ray we reduce the redundant portion of the lymphoid tissue—the superfluous, unnecessary portion. When that portion has been reduced the mucous membrane of the throat will fade and become normal in color and the size will shrink.

When the patient returns for re-examination, if you have undue redness left in any part of the throat you must repeat your treatment. I think it is better to have the patients return for re-examination to be sure they are left with normal tonsils than to give one treatment and let them go without assurance of the completeness of your treatment.

I want to thank the gentlemen for their discussion and especially coincide with Dr. Gibson's remarks about the value of the x ray on other inflamed tissues as well as infected tissues. He has had long experience with x ray treatments and the results and cures he has been getting in the respiratory tract are simply remarkable; so his observations along that line are truly valuable.

I want to state in 1914 I gave the first treatment. I believe it was the first treatment intentionally given to reduce an infected and hypertrophied tonsil. Since Dr. Weatherby's paper was written there was a Dr. Pierson of New York who began to go back over his cases that had been treated for tuberculous glands of the throat and neck for twelve years previous to that time. In some of those cases he had diagnosed hypertrophied tonsils and intended to remove them as soon as the tuberculous glands had been reduced. When he ran over these cases he found but very few returned for removal of their tonsils. On examination he found the tonsils had been cured. So that while inadvertently the tonsils were treated prior to 1914, so far as I can find out I was the first who instituted it for the definite object of reducing the tonsil.

I purposely omitted the technique because it will vary in proportion as the equipment varies. It will have to be tested out in each equipment. I do not use Weatherby's technique—not but what it is good and gets results. I use my own because it fits with my equipment.

The technique I use is a spark gap of eight inches. On my machine that equals 100,000 volts. Sometimes you can give an eight and one-half inch spark gap to equal 120,000 volts. Your technique will vary somewhat. I use five milliamperes of current and filter it through a heavier filter than any one I know

of. I use six milliamperes of aluminum and a distance of eight to ten inches and put two thicknesses of felt next the skin. I do not have cases of burning or bad after effects from the x rays. I think only in two cases I can recall was there even dryness of the mouth complained of by slowing down the action of the parotid gland.

I usually start a child with five or six minutes for the first treatment, or possibly all the way through, as during this last case mentioned with the simple hypertrophied tonsil. To this patient I gave four treatments on four successive days. To a patient with a hypertrophied and badly infected tonsil I give six minutes the first, seven the second and eight the third; and then two more treatments—five in all. Then I have the patient wait two or three weeks and come back for examination. If the tonsils are shrinking satisfactorily and the mucous membrane is fading and the soreness is leaving I will wait two or three weeks and re-examine. So I start out with a definite idea of keeping the patients under observation four months. During that time they are to return as often as I want for observation and treatment.

The price must vary according to circumstances. As a rule I treat during a period of four months' time. This is cheaper than they can have it done by enucleation if they go to the hospital and pay a fee for the operating room expense, and the surgeon charges anything at all.

CASE REPORTS

Schlatter's Disease: A Case Report*

MAX EMMERT, M. D., F. A. C. S.
Omaha, Nebr.

SCHLATTER'S Disease, or as it is sometimes called Apophysitis Tibiae, was first described in 1903 by both Schlatter and Osgood, who were working independently of each other.

ETIOLOGY

The etiology of the condition is not definitely settled. Schlatter contends that it is traumatic and results in a fracture of the beak-shaped process of the upper tibial epiphysis. This theory is supported by Hoglund, who reported 20 cases. Alsberg and Blenke, on the other hand, contend that it is of inflammatory origin. The probability is that both theories are right in part.

SYMPTOMATOLOGY

The condition occurs usually at the adolescent age between the twelfth and fifteenth years, and almost exclusively in boys. The clinical picture consists of swelling and tenderness over the tibial tubercle. As this is the site of attachment for the patellar ligament, the condition is more noticeable upon flexion of the leg, which extends the patellar ligament and makes visible to the eye and finger the hypertrophy of the underlying tissue.

DIAGNOSIS

The radiograph is the greatest aid to diagnosis, especially in the early cases. The picture is not uniform. In some cases there may be a complete separation between the tibia and the tongue-shaped process. In others a distinct fragmentation in several pieces or a clean fracture through the base of the process.

TREATMENT

When the condition is recognized early, immobilization of the leg in plaster of paris for three or four months will control the symptoms in most cases, according to Abt. The following case recently came under my observation:

CASE REPORT

Mr. W. F., aged 25, came in complaining of a "sore knee." At the age of 10 years he had noticed an enlargement and tenderness at the site of attachment of the right patellar ligament. This bothered him, especially when he was playing marbles. He had no knowledge of an injury.

*Received for publication April 16, 1925.

In 1917 the radiograph (Fig. 1) disclosed the presence of a small bony nodule apparently detached from the tibia. In 1920 he was thrown from a horse and injured the right knee. Since that time he thinks that there has been an increase in the size of the mass and increased soreness upon flexion of the leg. When the leg is straight it is comfortable.

Examination revealed the presence of a small, firm mass above the right tibial tubercle, which was slightly tender in the extended position of the leg. Flexion of the leg revealed a definite firm mass and increased tenderness. X ray (Fig. 2) disclosed a tongue-shaped, bony protrusion lightly attached to the underlying spinous process, which did not appear to be completely ossified.

On March 9th, the knee was flexed and an incision made through the patellar ligament. The bony mass was easily separated from the surrounding tissue and the wound closed. Early passive motion was started and the patient encouraged to walk about the seventh day. The patient was seen two weeks following operation, at which time he was bending the knee with perfect comfort.

446 Aquila Court.

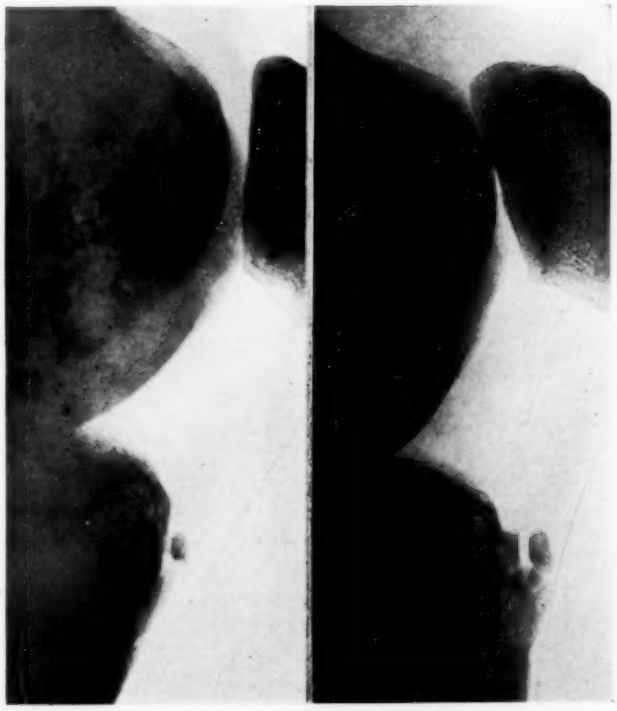

Fig. 1—X ray film made in 1917, showing the small piece pulled loose from the tibial tubercle.

Fig. 2—X ray film made in 1925, showing the pigment has not united.

NEW EQUIPMENT

Listening to the Electron

GENERAL ELECTRIC CO.
Schenectady, N. Y.

MAN has listened to the music of the spheres —including both the infinitely large and the infinitesimally small. Both the massive sphere, with a diameter of millions of miles, and the tiny sphere, with a diameter measured in fractions of millionths of an inch, have been "heard."

A few months ago French scientists "listened" to the star Capella. The light energy was changed to sound through the use of the photo-electric cell.

Scientists have recently succeeded in listening to the electron. The vacuum tube amplifier in which the amplification is carried to a hundred-thousand fold and with which a million fold can be reached, makes this possible. The sound produced by the electrons is caused by bombardment of the plate by electrons, released from the hot filament. It is these electrons, the smallest known particles of matter, which carry the current and which make the operation of the tube possible. The noise is, therefore, a fundamental property of electron emission, a characteristic of the electron, so to speak.

Dr. A. W. Hull of the research laboratory of the General Electric Company at Schenectady, N. Y., in a paper presented Nov. 29 at the annual meeting of the American Physical Society, described experiments conducted by Dr. N. H. Williams of the University of Michigan

and himself, in which they listened to electrons.

While users of vacuum tubes are not interested in listening to the noise, it is a phenomenon of scientific interest and in the research laboratory of the General Electric Company at Schenectady a careful study has been made of it. The work is being continued by Dr. Williams at the University of Michigan. It has been found that the noise is proportional to the number of electrons which fly across the tube each second.

The noise, due to the electrical oscillation which is set up by the impacts of the individual electrons on the plate, is known as the Schrot effect and was predicted on theoretical grounds by Dr. Schottky of Berlin. The energy of each blow is extremely minute, but, like rain drops, the energies of the many individual impacts add, and their sums become very large. With sufficient amplification, the blows may produce a roar like that of Niagara.

To listen to the sound of the electron is a feat in itself which gives an added charm to the vacuum tube. Listening to the electron, however, is but incidental to the studies which have been made by the scientists.

The electron is the unit charge of electricity and the determination of its electrical value is of the utmost importance. The oil drop method, devised by Professor Millikan in the Physics laboratory of the University of Chicago, gave science its first accurate measurements of the charge of the electron. Accurate as the experiments are, however, it is desirable that they be checked by some independent method.

Millikan's method of measuring the charge of an electron is based on the influence of grav-

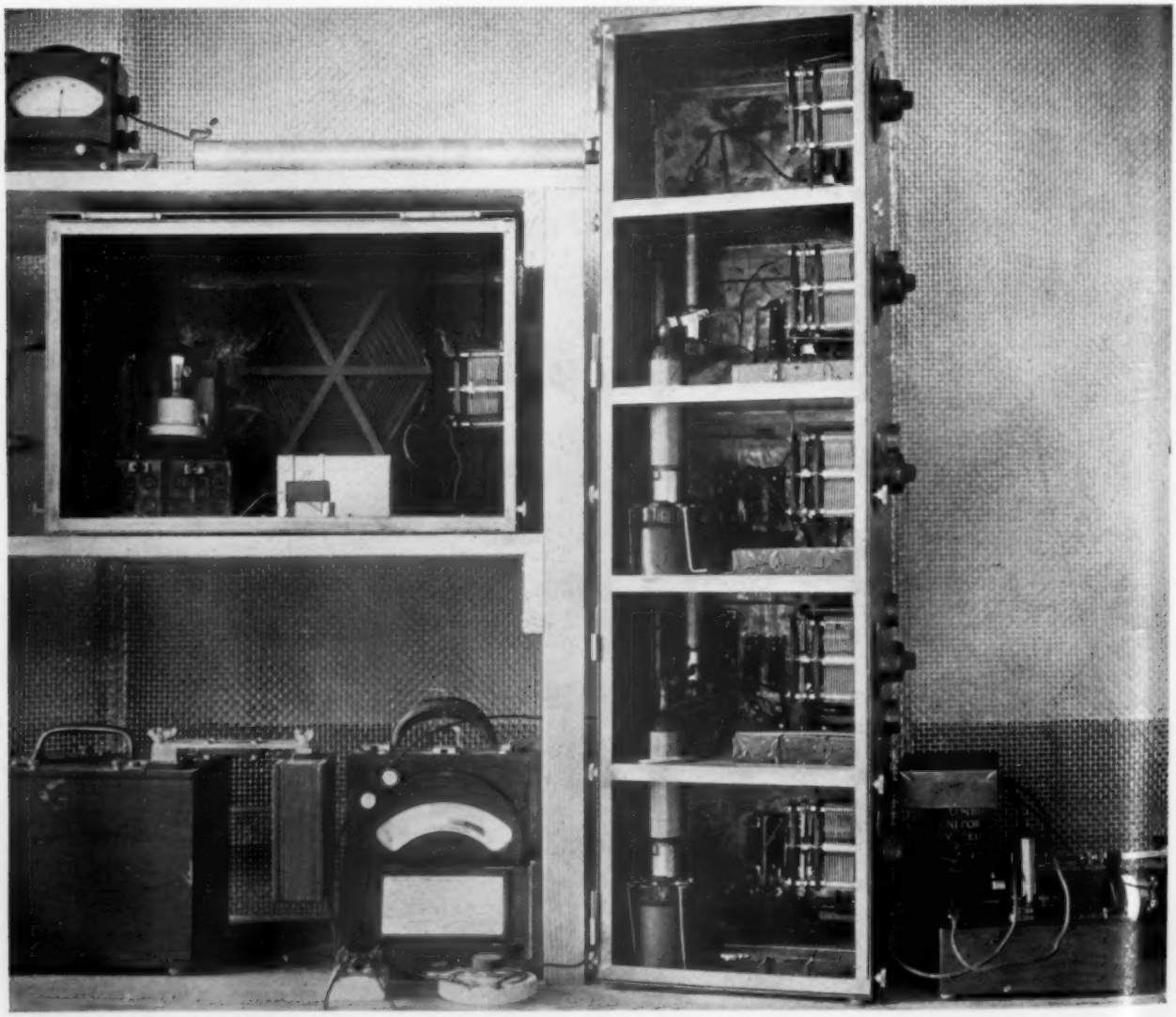

Fig. 1—Apparatus, listening to the electron.

ity and of electric charges on minute oil "droplets." These droplets are so small that the effect of gravity causes them to fall only a quarter of an inch in ten seconds—they are about three hundred-thousandths of an inch in diameter and are observed in a powerful beam of light with a small telescope. They are then seen as specks of light against a dark background.

In the formation of these small drops with an atomizer, occasionally one becomes charged by friction, *i. e.*, it may carry an additional electron. If then the droplet is between two electrically charged plates it will behave differently from the uncharged particles. Those which are not charged will fall. The charged particles will be attracted to the positive plate. By the use of the proper voltage between the plates, these charged particles can be made to fall more slowly, held stationary, or caused to move upward. If two electrons, instead of one, are held by the droplet, the effect is doubled. Measurements made by this method give the value of the electronic charge very exactly. In recognition of the importance of this work, the Nobel prize in science for last year was awarded to Professor Millikan.

Doctors Hull and Williams have measured the charge of the electron in a different way, by means of the Schrot effect, and have opened a field for research which promises to add materially to our knowledge of the electron and its properties. Previous attempts were made by German scientists to make the electron audible and to measure the charge of the electron by this method. Only approximate values were obtained, however. By the procedure used by Drs. Hull and Williams it is possible to obtain values of high accuracy, thus getting an independent check on Millikan's determination. The measurements thus far made by this method give a value for the charge of the electron within ½ per cent of that obtained by Millikan. Though as yet less accurate than the results of the experiments of Millikan, these measurements are capable of refinement which may equal or exceed in accuracy the oil-drop method. The new method is applicable to investigations in other fields of research as well. The scientists made the measurements while working with radio frequencies in the course of studying the tubes. The method can be used also for determining whether one, two or another number of electrons are given off as a unit in electronic phenomena.

Not long ago the electron was unknown. First scientists had the molecule, itself so small that man has not yet seen it. Then came the atom, the minute integral part of the molecule. For a long time the atom was considered as the ultimate particle of matter. But each element presents a different atom. Science was not content to rest. It sought to connect all phenomena, and the electron was the result.

Scientists now believe that all matter is composed of electrons and that different substances result from the different properties possessed by the atoms according to the number and arrangement of the electrons they contain.

EDITORIAL

The JOURNAL OF RADIOLOGY

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A. F. TYLER, M. D.
Managing Editor

ANNUAL MEETING
AMERICAN COLLEGE RADIOLOGY AND PHYSIOTHERAPY
CHICAGO
Oct. 19, 20, 21, 22

—o—

One Whole Day Devoted to Clinics; Actual Demonstration of All Branches of Physiotherapy, X Ray and Radium

—o—

Full Program in Next Issue

Annual Meeting—Committee Report

IT is indeed opportune to make a preliminary announcement of the annual meeting of the College.

This year's meeting will be ushered in by a full clinic day at the various hospitals in Chicago and every branch of physiotherapy in the various specialties will be duly represented.

While it is somewhat premature to give out a preliminary program, the committee desires to mention that it has the situation well in hand and that by the time the next issue of the Journal goes to press a complete program will be ready for publication.

Papers to be read at this year's meeting must be submitted to the Committee through its chairmen *six* weeks prior to the dates of the meeting. It is hoped that the speakers will give the text of their papers in abstract. This applies only to members of the College. Invited speakers may read their papers in full, but are asked to keep their remarks within thirty minutes' limit. Where lantern slides or moving picture films are shown, the time consumed must not infringe upon that of the other essayists.—*A. R. Hollender, M. D.*

Reminiscences

THE last meeting of the American College of Radiology and Physiotherapy, held in Chicago last November, was one of the best physiotherapeutic meetings of recent years. It was attended by a body of men and women who are really and truly interested in furthering knowledge in medicine. Its many papers, which bore testimony of careful and thoughtful preparation, were of scientific interest and in many instances of great practical value. That they were productive of much thought was shown by the extent and activity of the discussions, which brought out the best viewpoints along many lines. Each fellow must have carried away much food for reflection and many pointers as to treatment. There can be no question but what many of the papers brought us to a better understanding of pathology and of pathological anatomy, as well as the physiological action of physiotherapeutic measures. Without this knowledge, much that is done must be more or less nebular, haphazard and productive of poorer results than are obtained when a clear comprehension is possessed of the patient's needs, his pathological state and which particular modality is *best* suited to the particular case in hand. It can be truly said that no fellow left without additions to his mental and physiotherapeutic armamentarium. It is such meetings as these that add to the sum total of knowledge and make better fellows and better medical men of us all.

To the fellows of this college, the future of the organization and its success as a scientific body and its usefulness to the individual depend entirely upon the efforts and the work of each member. Without your cordial support and co-operation every endeavor will produce nothing worthy of a great organization.

With your help this college will grow, expand its field of usefulness and become a representative body of men who are a credit to the science of medicine and who will uphold all those tenets that have made the medical men of the past loved, respected and revered.

Curran Pope, M. D.

President American College of Radiology and Physiotherapy.

Insane Fringe of the Medical Profession

THE insane is here defined as a deviation from the normal. A normal in the medical profession is an average general practitioner. It is, therefore, understood that what is written applies to that serrated portion of the "circle mass" which has become frayed because of unstable and inadequate medical balance.

As in every walk of life misfits exist, so in medicine does the incongruous worm his presence into the activity of the field. Carried along by the momentum of the able, earnest and serious, he holds on to coat-tail ends, hinders normal strides by stepping on the heels of the worker, and burdens the path of advancement by the sheer weight and bulk of his presence and lack of comprehension.

Too often his viewpoint is a commercial one and the more unlikely and incredulous his thoughts—the louder and more blatantly he boasts. Sometimes he stops long enough to utter, under his breath, low guttural protests of the unfairness of things and the unjust distribution of brains, though he does not call it that. And—in between times—clothed with the authority of his musty M. D. degree, as a self-appointed committee of one, he answers the charitable (?) urge to educate the public.

Always greeted by an audience composed of his own ilk—ever eager to hear of the shortcomings of the scientifically trained—he tells them of the pitfalls of serums, vaccine, antibodies, unnecessary surgery, the limitation of medicine and the medically controlled activities of the country. In fact, he criticizes wantonly and destructively—endeavoring to discredit the advancement of progress, vainly trying to arrest development and enlightenment—denying the possible logic and truth of anything his limited, overstimulated and fatigued mind cannot grasp—as impossible, illogical and unworthy—thinking always to keep the rest of the world as ignorant as himself—by this pseudo-scientific refutation of all skilled achievement beyond his own limited skill.

Curious enough—but perhaps not so strange, either—it is this moron of thought who is the gullible, credulous, all-believing, well-wishing chap who hurries to any and all miraculous modes and means of helping the poor and unfortunate sick—providing that mode or means of assistance can be delivered by himself at a sizeable profit.

And the more incredulous, ridiculous and impossible the fullfillment of his promises, and the greater the infringement upon the accepted dictum of accredited aid, the louder he shouts. Together with the far-seeing and sometimes not at all too truthful (even though he did know better) commercial salesman, he makes a formidable affront and attack that returns to him a beginning financial success that elevates him to a position far beyond his mental capabilities, and one he knows—deep in his own heart—he is not worthy to fill.

But, nevertheless, he goes on shifting his array of attack with the changing straws of the therapeutic wind. And at times, sought by those who may benefit commercially, he even assumes to write, recording phenomena of observation and attempting deduction and explanations of physiological processes that would do credit to trained clinicians and laboratory experts of unlimited facilities and years of practice—if they were only true. Sadly enough, he is read by some who want to believe what he writes and, not having authority wherein his prating can be contradicted, he is accepted as a possibility. Many times his readers attempt to accomplish his claims—even at the risk of purchasing expensive equipment, with which to duplicate the promised results—and perhaps just as often fail. The chagrin and reaction to failure more often than otherwise brings contempt and disgust and serious condemnation.

Many means of therapy have known just such a fate, and perhaps rightly so, too, but undeniably there are others discarded because of just such an inadequate background. Unfortunately, physiotherapy was handed to the profession and the public in its beginning by many members of this lunatic fringe, and undoubtedly should have gone the way of the charlatan route had not the great war called its activities to the front and had not its merits risen to the demands made, even as exacting as they were—and had not men of

scientific attainment seen the possibilities therein and insisted upon the development of this branch of therapy along the tested and tried lines of other scientific procedures.

Too much of the untrue, too much of the unproven and problematic has been spread—claiming the unattainable for this field—tending to make ridiculous a therapy that, properly held and properly used, can stand upon its own merits unassisted.

Happily, that time has arrived, or is fast arriving, when the accumulated experimental data and the proven clinical knowledge of experience will be correlated and its proper place in treatment assigned with the dignity deserved.

The four winds are burdened overly heavy, scattering this physiotherapy chaff to the discard heap, and now comes the steady grind of the experimental mill, turning slowly, but nevertheless accurately, and truthfully carrying to us the everlasting facts. A fond "adieu" to the temporary activity of the lunatic fringe in physiotherapy!—*W. Scott Keyting, M. D.*

Radium and Radon

LESS than a half pound, between 200 and 220 grams, of radium has been produced in the world since Madam Curie discovered this precious element in 1898, Dr. Charles H. Viol told members of the American Chemical Society meeting in Baltimore. Dr. Viol is director of the Radium Research Laboratory of the Standard Chemical Co., of Pittsburgh, which has produced nearly half of the entire supply.

"Small as this quantity of material is," said Dr. Viol, "it represents an almost unbelievable amount of work and expense in the refining of the radium and at the present price represents a total value of $15,000,000. Its commercial production entails the handling of enormous masses of minerals. When carnotite from southwestern Colorado is used as the source, more than 500 tons of ore must be handled to yield one gram of radium. In this process a like tonnage of chemicals, a thousand tons of coal and upwards of ten thousand tons of treated or distilled water are used—the final product being pure radium bromide, a white powder resembling powdered sugar, having a bulk sufficient to half fill an ordinary thimble."

Dr. Viol demonstrated radon, which is continually being formed from radium, but is 160,000 times more active. While its price per weight is much greater than radium, it has been found that $25 to $50 worth of radon will treat conditions requiring $2,000 to $4,000 worth of radium. However, it loses half of its activity in about four days, he said, so that it can only be used for a limited number of patients, while radium may be used repeatedly. The small bulk of radon, however, is an advantage, for the tiny tubes containing it may be imbedded directly in a tumor mass, so that all the radiations are utilized in the destruction of the growth.—*Science.*

Doctor Charles Homer Ball

THE swift messenger of death invaded the sessions of the Oklahoma State Medical Association at its annual convention at the Mayo Hotel in the city of Tulsa on May 12th, 1925, and at 2 P. M., while reading a paper before the section on Genito-Urinary and Skin Diseases, Dr. Chas. H. Ball of Tulsa, one of our most active members, was stricken with a cerebral hemorrhage, dying seven hours later at his home, despite the efforts of his closest friends in the profession of his own city and some of the most noted specialists in the state in attendance at the state meeting.

Dr. Ball was born at Powellsville, Ohio, September 1, 1867, and received his education at the Southern Illinois Normal, later attending St. Louis University, from which he received his degree in 1906.

At the time of his death Dr. Ball was fifty-seven years of age. He was associated with the St. Louis Skin and Cancer Hospital for a period of ten years. Removing to Tulsa in 1917, he soon built up a splendid practice as a Dermatologist and X Ray expert, taking an active part in the Tulsa County and Oklahoma State Medical Association. He served in various offices in both, having been President of Tulsa County Medical Society in 1921 and Vice President and Councillor of the State Association the following year.

In the death of Dr. Ball, Tulsa County loses one of its most valuable members, as he was ever ready and willing to do his part for the advancement of the Society and the profession he loved so well. Dr. Ball was married in St. Louis in 1893. The widow and four children are left to mourn his departure.—*J. Oklahoma State M. A.*

John Addison Fordyce*

THE death of Dr. John Addison Fordyce on June 4, 1925, has deprived the medical world of an able teacher and research worker. His continued studies and investigations will go down into the annals of modern medicine as distinct contributions to the science and art of Dermatology and Syphilology.

Dr. Fordyce was born in Guernsey County, Ohio, on February 16, 1858. He studied at Adrian College, the Chicago Medical College and the University of Berlin, receiving the degree of Doctor of Medicine from the two last named institutions, from the Chicago Medical College in 1881 and from the University of Berlin in 1888. As early as 1891 his Alma Mater, Adrian College, from which he previously received the A.B. and A.M. degrees, conferred upon him, as a recognition of outstanding service and achievement, the honorary degree of Doctor of Philosophy.

Dr. Fordyce was Professor of Dermatology and Syphilology at the College of Physicians and Surgeons of Columbia University, Special Regional Consultant of the Division of Venereal Diseases of the United States Public Health Service, Visiting Dermatologist to the New York City Hospital and Consulting Dermatologist in the Neurological Institute, Presbyterian Hospital, and Women's Hospital of New York City. He was known for his genuine and unselfish devotion to and interest in the prevention of disease and the advancement of medicine. He was ever ready to join enterprises which offered opportunities for service. In 1920 he gave a notable series of lectures on the diagnosis and treatment of syphilis at the Institute on Veneral Disease Control and Social Hygiene, held at Washington, D. C., under the auspices of the United States Public Health Service. He was also an active member of a number of medical and scientific societies.

In 1896 Dr. Fordyce called attention to a disease affecting the mucous membrane of the lips, and consequently known as the "Fordyce Disease." This gave impetus to a further study of this cutaneous infection by Dr. Fordyce and others, which led to its definite diagnosis and mode of treatment. He is also known for his research in quantitative studies of syphilis from a clinical and biological point of view, neurosyphilis, spinal fluid examinations, congenital syphilis, the pathology of syphilis, and dermatology.

Dr. Fordyce was a prolific medical writer. He is particularly known for his contributions to Morrow's System of Genito-Urinary Diseases, Syphilology and Dermatology, Parker's Surgery by American Authors, and Wood's Reference Handbook of the Medical Sciences. He is the author of many articles in medical journals and magazines. He was editor of the Journal of Cutaneous and Genito-Urinary Diseases from 1888 to 1896, inclusive, leading this specialized professional journal through an important stage in its growth and development.

Dr. John Addison Fordyce will be remembered by many students as a skillful teacher and by the medical profession at large for his research contdibutions to a more complete knowledge and practice of Dermatology and Syphilology.

*United States Public Health Service.

Inter-State Post Graduate Assembly of America

THE Inter-State Post Graduate Assembly of America will be held at St. Paul, Minnesota, October 12th to 16th, inclusive, 1925.

The preliminary list of those who will appear on the scientific program contains the names of many of the most recognized men in the medical profession.

United States Civil Service Examination

THE United States Civil Service Commission announces the following open competitive examination:

PHYSIOTHERAPY AIDE
PHYSIOTHERAPY PUPIL AIDE
PHYSIOTHERAPY ASSISTANT

Receipt of applications for these positions will close August 29, September 26, October 24 and November 28, 1925. The dates for the assembling of competitors will be stated on the admission cards sent applicants after the close of receipt of applications.

In the Public Health Service the entrance salary for physiotherapy aide is $1,020 a year, with quarters, subsistence and laundry; for physiotherapy pupil aide, $720 a year, with quarters, subsistence and laundry, or $1,200 a year without allowances. The salary of physiotherapy assistant is $1,500 a year, without allowances.

In the Veterans' Bureau the entrance salary for physiotherapy aide is $1,680 a year; for

physiotherapy pupil aide, $1,000 to $1,400 a year, depending upon the training and experience of the appointee. The compensation of physiotherapy assistant is $1,320 to $1,600 a year.

The duties of physiotherapy aides consist of administering physiotherapy in its several branches—massage, electrotherapy, hydrotherapy, mechanotherapy, thermotherapy; active, passive, resistive and assistive exercises and remedial gymnastics; keeping daily record of the work and progress of each and every patient coming under direction and treatment; and making the required reports of the activities of the reconstruction work in physiotherapy.

The duties of physiotherapy pupil aides are the same as those for physiotherapy aide, except that they are pupils under the supervision and instruction of the chief aide in all the work above mentioned.

The duties of physiotherapy assistants consist of administering to special cases the treatments of physiotherapy, as massage, electrotherapy, hydrotherapy, thermotherapy, mechanotherapy; active, passive, resistive and assistive exercises and remedial gymnastics; keeping a daily report of the work in progress on each patient under the appointee's direction and treatment; and making the required reports of the activities of the reconstruction work in physiotherapy.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil-service examiners at the post office or customhouse in any city.

American Board of Otolaryngology

AN examination was held by the American Board of Otolaryngology on May 26, 1925, at the Medico-Chirurgical Hospital, Philadelphia, with the following result:

Passed	137
Failed	20
Total examined	157

The next examination will be held at the University of Illinois School of Medicine on October 19, 1925. Applications may be secured from the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

ABSTRACTS and REVIEWS

Physiotherapy in General and Diathermy in Particular. B. T. Green, M. D., J. Lancet, 45:38-40, January, 1925.

PHYSIOTHERAPY has been seriously neglected by the medical profession and as a result it has been exploited by some inadequate medically for its application. These, few as they may be, have caused this valuable physiological adjunct to be consigned to temporary oblivion by the medical profession at large. "While the medical profession is to be commended for its conservatism in accepting new and untried therapeutic measures, it should be more prompt in examining their claims," and physiotherapy claims superior therapeutic value as an excitant of corrective physiological reactions. This accusation of neglect has been clearly demonstrated in the time-honored physical remedy, massage, that was formerly employed by the profession, only to be appropriated by two cults for the development and popularization of false theories of healing.

Physiotherapy is the treatment of disease by physical agencies. In other words, physiological reactions in living tissue are induced by the activations of either mechanics, heat or chemistry, or by some combination of these. In all physical therapeutic agencies, one of these three modalities predominates: the mechanical in massage, vibration, sinusoidal, static electricity; the thermal in all forms of heat,—conductive, radiant, convective and conversive; the chemical in ultra violet light, galvanism and x ray.

The field of physiotherapy is inflammation and its activities are confined to living tissue. Since the reactions of inflammation are always independent of the cause, it follows that the cause, if still active, should have primary attention. But physiotherapy is simply a remedy to be rationally selected and applied where indicated.

Of course, physiotherapy has its failures, which may be due to a variety of causes: (1) there may be failure in the reaction of the tissue (a tissue that is dead cannot react); (2) fault in diagnosis is another cause (an overstimulated nerve cannot improve under more stimulation); (3) lack of proper control of the patient (damage in excess of repair); and (4) failures due to faulty technique. Faulty technique is the greatest drawback to the satisfactory results either because of indifferent results, no results, or to actual damage.

Specifically, the author discusses the treatment by diathermy which, with correct technique, gives the patient no electrical effects. The patient has the sensation of heat and of heat only. Treatment by this modality must not be considered from any other standpoint than heat, and it must be used only when heat is therapeutically indicated. This production of heat in the tissues is explained by physical law. The d'Arsonval current, with its low measurable amperage and high controllable voltage, is bipolar with the tissues under treatment completing the circuit. The current, meeting the resistance of the tissues through which it passes, is transformed into heat. The heat is, therefore, formed in the tissues and nowhere else, because it is there and there only that the current meets sufficient resistance to make the transformation. This heat can be localized at the will of the operator.

The therapeutic value of heat so produced and localized in pathological tissue, states the author, is explained by reactions. It produces an arterial hyperemia, increasing nutrition to the part; dilates capillaries, venous and lymph channels, increasing drainage and favoring osmosis; the high degree of heat inhibits bacterial growth and increases phagocytosis; fibrosed areas are softened, the inflammatory tissue is dissolved and the debris eliminated; pain is relieved because pressure is removed. The end-result is repair of the disease tissue under treatment.

Actinotherapy. Edwin N. Kime, M. D., J. Indiana State M. J., 18:49-51, Feb., 1925.

THE passage of an undirectional electric current through the vapor of mercury enclosed in a quartz vacuum tube produces an intense illumination which provides a much greater quantity and quality of ultra violet energy than that issued from any other known source.

There are certain local clinical effects that are due chiefly to short or far rays:

1. Germicidal Activity. On superficial infections, such as furunculosis, early carbuncles, late carbuncles after surgical drainage, erysipelas and certain parasitic skin affections, tineas, mycoses, lupus, etc., the short rays have a definite local germicidal reaction.

2. Superficial Irritation. Ranging from a mild to a destructive erythema, depending upon whether cellular degeneration or keratolytic action is desired, *e. g.*, ulcers, varicose, infective or neoplastic, the short rays are utilized in conjunction with other therapy. It is applied also in psoriasis and dry eczemas.

3 Counter Irritation. A large group of entities, deep seated pain and inflammation in underlying viscera or those capable of being influenced by reflex action, neuralgia, myalgia, lumbago, sciatica, are all palliated or relieved by this therapy. Focal infection must be diagnosed and eradicated, and metabolism must be considered in all these cases. The anesthetic effect of the actinic rays is largely empirical, but nevertheless clinically demonstrable.

There are certain systemic effects which are chiefly due to long or near actinic rays:

1. Calcium Deficiencies. In such calcium deficiency diseases as rickets, certain forms of tuberculosis, osteomalacia and certain cases of eczema, urticaria, asthma, hay fever and hyperesthetic rhinitis, blood calcium determinations are advisable. If they are low the treatment is effective. If not, they may be dsappointing except in rickets, in which the treatment appears to be specific.

2. Dyscrasias. In secondary anemias, chlorosis and certain so-called "general run down" conditions, neurasthenia and psychesthenia, all of which have an organic basis if we are only able to demonstrate it. The treatment is largely empirical and should closely be checked with blood and urine chemistry.

3. Low Metabolism. Whenever there exists a demonstrable low basal metabolic rate, in addition to the presence of characteristic clinical syndromes of thyroidal, hypophyseal or ovarian insufficiency, consideration should be had for the actinotherapy. Appropriate organotherapy is indicated as the main treatment, actinotherapy as an important adjunct.

In the private practice of the author, in which over 500 irradiations were given over 100 private patients, the most satisfactory results have been in those treated for local conditions such as furunculosis, acne vulgaris, early carbuncles, eczema and psoriasis, also in the relief of pain of acute infections of the

chest, toxic neuritis, sciatica, lumbago and facial neuritis. The results upon systemic irradiation are not so quickly apparent. Anemias improved and basal metabolic readings increased under systemic radiation.

There are certain contra-indications that should be borne in mind just as religiously as the indications:

1. Pulmonary Tuberculosis. When open lesions, together with a marked congestion exist, radiation must be applied with caution. Actinic radiation has been shown to cause marked hyperemia of the lungs, liver and other viscera.
2. Increased Metabolism. Such cases immediately blow up under systemic radiation.
3. Conjunctival Irritation. The conjunctiva is very sensitive to actinic rays and should be protected at all times.

Value of Electrothermic Methods in the Treatment of Malignancy. GRANT E. WARD, M. D., J. A. M. A. 84:660-666, Feb. 28, 1925.

THE aim of the author in this discourse is to furnish a comprehensive summary of the underlying electrical principles involved in the electrothermic method of treatment of accessible neoplasms, together with a study of the clinical results and the further possibilities of relief to cancer sufferers.

It was Pozzi, in 1907, who described the "cure of malignancy" by the action of the sparks from the terminal of an Oudin fulguration. The next step from the fulguration machine of Pozzi was the electrocoagulation apparatus of Doyen. Instead of using a part of the Oudin resonator as the secondary coil, from the end of which the current was taken off as a unipolar one, Doyen shunted across from one wire, leading from the distal end of the primary coil to the distal end of the secondary coil, using the whole resonator as the secondary coil. In the modern apparatus, shunting is not done, but a part of the Oudin resonator is taken as the primary and the entire resonator as the secondary coil, thereby making it an autotransformer. By varying the ratio between the primary and secondary turns of the Oudin coil, varying amounts of amperage and voltage may be obtained to meet the demands of the surgeon. The machine used in the study here reported gives a current of 30,000 volts and 300 milliamperes, with a frequency of oscillation of 1,250,000 and a wave length of 240 meters.

Two effects of this current are produced on the tissues, depending on the amperage and voltage of the current applied. The one action is a dehydration or desiccation and consequent shrinking of the cells termed electrodesiccation, and the other is an actual coagulation of the tissue proteins into a homogenous cell mass, the process termed electrocoagulation. Desiccation is usually accomplished by a unipolar current and coagulation by a bipolar one. In electrodesiccation and electrocoagulation a most efficient method of heat production and heat distribution throughout the diseased area is obtained. The depth of cell destruction is proportional to the strength and kind of current used. An increase in the voltage results in more force with which to carry the amperage; and the increase in the amperage results in a greater heat production. The end result is an increased coagulation and a deeper secondary sloughing.

The essential feature of the technique in the application of electrodesiccation and electrocoagulation is the development of accurate judgment as to the extent of the disease. In the method of treatment, either a general or local anesthetic is used, depending upon the degree of involvement and the area involved. For the active electrodes ordinary cambric needles have been adopted for surface treatments, vaginal, cystoscopic, rectal and oral cases are being treated with needles of varying lengths and shapes, carrying rubber insulation to within a half inch from the tip. The inactive electrode consists of a large moist pad about 8 by 12 inches, placed under the back or buttocks of the patient. The construction of the pad consists in a wire leading from the electrical machine to a piece of thin sheet copper or heavy wire mesh. The current should be evenly distributed throughout the inactive electrode, thereby spreading it and producing a burn. Before applying the needle the strength and quality of the current are tested on a piece of metal. When the desired quality is obtained the needle is inserted into the tissue and the current is turned on. In treating large areas of disease the author advises the construction of a line of coagulation around and beneath the areas so as to cut off the blood and lymph drainage from the part. Overtreatment must be guarded against, for destruction of tissue goes far beyond the area of white coagulation.

The endotherm needle is used for removing warts and other superficial skin tumors, or may be used in opening the abdomen or in amputating breasts, when a diminished amount

of bleeding and a possible reduction in the danger of disseminating the disease is desired. The endotherm knife current is of higher frequency (1,500,000), lower voltage (500 volts) and lower amperage (5 milliamperes) than the current of desiccation and coagulation.

No matter what the mode of treatment, it is always well to check up the result of the treatment by the use of the microscope. In case the eradication has not been complete after the first treatment, a second and third may be carried out without fear of overtreatment.

In case of small and superficial growths, all that is necessary is to insert the needle, turn on the current and, when the diseased area is white, stop the treatment. With this type of case, healing is assured in from two to four weeks, depending naturally on the size and depth of the lesion. With large cancers, plastic operations are of great help in hastening a good cosmetic result. A great advantage of this method over roentgen ray and radium is seen in the rapidity with which healthy granulations spring up after the slough has been removed, giving a splendid surface for skin grafting. There is none of the slow healing, indolent ulceration so frequent with radiation therapy.

In superficial diseases, as eczema and mild keratoses, sparking is used. Here it is not necessary to thrust the electrode into the skin, but it is preferable to hold it away, allowing a spark to form which will then cause only superficial desiccation.

X Rays in the Treatment of Various Inflammatory Conditions. Simon Albert, M. D., Rhode Island M. J., 8:90-92, June, 1925.

ROENTGEN ray treatment of various types of inflammatory conditions is not something new in therapeutics. The foreign literature particularly has frequent mention of its great value.

In the treatment of felons, paronychias, boils and carbuncles, radiation is an extremely useful adjunct to surgery. Both acute and chronic conditions nearly always respond favorably. The best results, however, are obtained in the early stages of the various processes, at the time when severe reactions have not yet become manifest. In the very early stages, these infections can be aborted with great frequency.

In painful neuralgia, x ray treatment should not be forgotten. It will frequently give relief when other methods have failed. It should, in the opinion of the author, be given a trial before attempting surgical procedures.

The dosage consists of very small fractional units. Overdosage must be guarded against.

Treatment of Some Common Skin Diseases of the Face. William J. MacDonald, M. D., Boston M. & S. J., 192:302-304, Feb. 12, 1925.

THE apparent simplicity of some of the diseases of the cutaneous tissues does not alter their importance to the patient. It is the consideration of these simple skin diseases with which the author concerns himself in this article.

1. Acne vulgaris, "even allowing for the natural enthusiasm each one has for his special method of treatment," is readily cured by the roentgen ray. There is not the slightest danger of a burn when a fractional dosage, which is advocated for this disease, is used. The ultra violet rays, on the other hand, proved of no permanent value, but has been effectively used towards the closure of the roentgen ray course. Ointments and lotions used in conjunction with the roentgen ray are contra-indicated.

2. Basal cell epithelioma have responded favorably to the following technique: Cleanse the affected area and spray with ethyl chloride. Rapidly gouge out the diseased area with a sharp curette. Control the bleeding and ray the area with a double erythema dose. Protect the wound with a dry dressing.

3. Rosacea is first treated with an application with Lotio Alba. When pustulation occurs the roentgen ray produces satisfactory results.

4. Eczema has been found to react so favorably to the roentgen ray that many dermatologists are employing this mode of therapy for the treatment of chronic eczema of the face.

5. Seborrhea is a troublesome malady. For this annoying oiliness much can be done by medicated steam and astringent lotions. If relief does not follow, the author suggests that x ray has a selective action on the epithelial lining of the sebacious and sweat glands and upon its application beneficial results will be obtained.

6. Keratosis senilis, if mild, may be successfully handled with the trichloracetic acid cautery, but in the more severe cases x ray administration is recommended.

7. Hypertrichosis is a disease which can be effectually cured with the electric needle. The cosmetic result is good, and the patients are always satisfied with the results. X ray is

not advised for the treatment of this condition.

8. Naevus pigmentosus may be eradicated by the electric needle. The cosmetic result is excellent.

Skin Reactions to Simultaneous Treatments With Radiant Heat and Soft X Rays. James A. Hawkins, Ph. D., and Harry Clark, Ph. D., J. Exper. Med., 41:761-766, June, 1925.

GUINEA PIGS were exposed to suberythema doses of soft x rays, to radiant heat of intensity about critical for producing slight burns, and to both radiations simultaneously. No erythema was produced in the skin of the animals exposed to x rays alone and only slight burns resulted in 50 per cent of the animals exposed to heat radiations alone. The animals exposed to heat and x radiation simultaneously developed well marked burns, which healed much more slowly than those produced by heat alone.

A Summary of the Effects of Repeated Roentgen Ray Exposures Upon the Human Skin, Antecedent to the Formation of Carcinoma. S. Burt Wolbach, M. D., Am. J. Roentgenol., 13:139-143, February, 1925.

IN the experimental exposure of animals to the roentgen ray, the earliest demonstrable change in the skin noted by the author is a very striking swelling of the collagen of the corium and subcutaneous tissue, which was visible microscopically in from forty-eight to seventy-two hours and reached a maximum in from six to eight days. Coincident with this microscopic change there is a marked gross shrinkage of the skin which can easily be observed if the area of exposure is outlined by means of a strong dyestuff. Some of the connective tissue cells are destroyed; and many survive, as is evidenced by mitotic division a few days after exposure. The duration of the latent period of the roentgen ray "burn" depends upon the time required for equilibrium to be established between the altered collagen and the tissue liquids.

This connective tissue reaction also explains many conditions found in chronic roentgen ray dermatitis. At the time that these changes which were noted in the corium of the skin occur, similar changes occur in the blood vessels, accounting for the thickening and eventually for the occlusion of the blood vessels. Changes were observed in the epidermis on and after the fourth day and consisted of swelling of the cells and their mitotic division.

With subsequent exposures, subsequent changes occur in the dermis and epidermis. It is these constant exposures that call forth proliferative activities on the part of the epidermis in excess of the rate of normal proliferation which are of prime importance in the consideration of the origin of epidermoid carcinoma in chronic roentgen ray dermatitis. "We stress the observation that the acquisition of malignant properties is not a sudden one, that it is gradually acquired in the course of years. We believe that the epidermis is a transparent tissue and is not injured by the passage of rays. Reactions of the epidermis, we believe, are secondary to lesions in its supporting tissue, the corium. For many years following injuries by roentgen rays, the epidermis proliferates and behaves as it does in normal reparative processes. The acquisition of malignant properties follows sustained proliferative activities in contact with an abnormal supporting tissue."

The Menace of Poorly Fitted Spectacles in Old Persons. John J. Morton, M. D., J. A. M. A., 84:666-668, Feb. 28, 1925.

IN this short series the author reports four cases in whom chronic irritation caused by poorly fitted glasses seemed to play a part in the localization of the malignancy. This fact seems to be especially applicable in those patients beyond middle age, and the danger is considerably increased when the senile changes have taken place in the skin of the irritated area. It is in view of this possibility of malignancy occurring in an irritated area that one should be especially careful and advise the correction of the maladjustment of their spectacles.

Radiant Energy in the Treatment of Otitis Media. Abraham R. Hollender, M. D., and Maurice H. Cottle, M. D., Eye, Ear & Throat Monthly, xx 4: No. 1, Feb., 1925.

THE treatment of otitis media is still an unsettled problem in otology. In acute otitis media, among the measures employed heat has been depended upon as a valuable adjunct in the treatment. The radiant heat lamp is highly efficient because, in addition to the heat produced, there are other qualities which undoubtedly have a favorable therapeutic action. Absorption of radiant energy follows penetration when dealing with the longer wave lengths. When this energy is absorbed into living tissues it is converted into heat or cal-

ories—and this brings about an activation of cellular metabolism—locally, over the irradiated part, and distally, because of vasomotor changes that always follow hyperemia. Radiant energy is best transmitted through glass that is clearly transparent.

In this article a resume of the varieties of treatment employed in chronic purulent otitis media is given, reference being made particularly to ultra violet therapy. Ultra violet rays in chronic "running" ears, where no caries was present and where pathological conditions in the nose and pharynx had been corrected, have given favorable results. This therapy does not conflict with the other measures which one may want to use. Quartz light, in concentrated form, is a destructive agent to bacteria. The action is undoubtedly due to reduction. Body metabolism is influenced by ultra violet irradiations. "Normal blood absorbs light rays in large amounts, a Finsen showed, and it is quite possible that changes in the chemistry of the blood result from the light rays."

The Treatment of Malignant Diseases in the Mouth. G. W. Grier, M. D., Am. J. Roentgenol., 12:347-352, October, 1924.

IN the substance of this article four important facts were emphasized:

1. The majority of patients with malignancy of the mouth die of metastases. Therefore, the treatment of these metastases is an absolutely essential part of any plan of treatment.

2. The primary lesion must be treated thoroughly and accurately with a definite idea of what the treatment will accomplish. A temporizing method of treating and observing results and repeating this indefinitely is not permissible.

3. Lesions on the alveolar processes, buccal mucous membrane, roof of the mouth and floor of the mouth are better treated by contact application than by imbedding needles.

4. Over-dosage with imbedded needles causes extensive sloughing, which does more harm than good.

A Study of the Influence of High Voltage Roentgen Irradiation on Salivary Secretion in Dogs and Its Effect on the Sensibility of the Buccal Mucosa. J. T. Case, M. D., and W. N. Boldyreff, M. D., Am. J. Roentgenol., 13:130-139, February, 1925.

THE following points tabulated by the authors adequately summarize their observations:

1. Large doses of roentgen irradiation diminish intensely the sensibility of the mouth. The change is not permanent, for the sensibility later improves, but evidently is not completely restored.

2. This decrease of general sensibility of the mouth is an experimentally observed fact, but a logical conclusion from this fact is that there is a decrease in specific sensibility; that is, the sensation of taste. This is in accordance with the commonly observed disorders of taste observed by our patients in clinical work undergoing analogous treatment. A definite plan has been devised for an exact experimental study of this point and a further report will be made on it later by the authors.

3. The decrease of sensibility and its tendency toward restoration are directly dependent upon the dosage of roentgen rays administered.

4. The specific sensibility of the nose and other sense organs about the face is in all probability similarly diminished under roentgen treatment. Exact studies on this point are suggested by the writer.

5. On dogs there was observed a decrease in the ability to control the various muscular movements associated with mastication and deglutition. This phenomenon must depend on the influence of the roentgen rays upon the peripheral motor nerves controlling these muscles.

The Roentgen Ray Treatment of Diseased Tonsils and Adenoids. Harold G. F. Edwards, M. D., New Orleans M. & S. J., 77:431-433, April, 1925.

THE surgical treatment of diseased tonsils and adenoids has not proved altogether satisfactory. Moreover, the tonsil has a function which great care should be taken to preserve. It is reasonably certain, says the writer, that with sufficient time and correct dosage, repeated if necessary, atrophy of the tonsil, similar to the normal physiological retrogression, can be obtained and all evidence of disease removed. The results of roentgen ray treatment have been very satisfactory and the literature on the subject is evidence of its efficacy.

Treatment of Diphtheria Carriers by Roentgen Radiation. Dalton Kahn, M. D., Am. J.

Roentgenol., 12:343-347, October, 1924.

DATA are presented which show that 152 of the original 185 cases of carriers treated by roentgen radiation have tended to remain free from virulent diphtheria organisms, as determined by reculture after an interval of ninety days.

A second series of 23 cases was presented, in all of which the author is able to obtain negative cultures after one or at the most two roentgen treatments—treatments which were slightly longer in time exposure than formerly.

Complete histories were given of three additional cases that were true carriers, which cleared up after roentgen treatment, other measures having failed.

The technique now recommended for the treatment of diphtheria carriers is as follows: 5 ma. at 10-inch focal skin distance, with a 7-inch spark gap, filtered through 3 mm. Al., for a thirteen-minute and twelve-second exposure to administer 2 skin units. The time of exposure can be doubled or trebled without crossing the danger threshold; but the maximum used has been a four-minute exposure.

The advantages of radiation over tonsillectomy, or antiseptic applications are many fold and are clearly discussed in the substance of the article.

Juvenile Nasopharyngeal Fibroma Treated With Radium, With Report of Case. D. Y. Keith and J. Paul Keith, Kentucky M. J., 23:26-28, January, 1925.

THE authors present a patient, aged 16, with a history of an enlargement in the region of the left parotid noticed some two years ago. He was subjected to operation for the removal of adenoids and tonsils, at which time tissue in the left tonsillar fossa occasioned the pathological report of "suggesting sarcoma." This was about one year prior to the radium applications.

Approximately two years after the onset of initial symptoms, examination revealed a tumor mass filling the left side of the throat. A 10 per cent solution of cocaine was used for local anesthesia. The anterior pillar was pulled upward and outward. Four radium needles, each containing 12½ milligrams of radium, were inserted into the superior portion of the tumor, about one centimeter apart. These needles remained in position for twelve hours. The following day radium capsules were inserted through the nose into the posterior nares by means of a catheter, in a manner similar to the way a nasal plug is pulled into the posterior nares for hemorrhage. Two days later a radium capsule containing 50 milligrams of radium was pulled up through the mouth into the posterior nares and allowed to remain for eight hours. Five days later applications of deep x ray were begun, using 200 kv., 4 ma., 1 mm. Cu., and 1 mm. Al. and leather as filters at a skin distance of 22 inches. An hour's application was administered directly into the nasal fossa and antra anteriorly, another over the left parotid area, a third over the parotid area and a fourth hour's application over the posterior cervical area. The above applications were given for thirty minutes each day over a period of eight days, the entire radium and x ray treatment requiring eighteen days. Improvement was almost instantaneous, an examination two months after the treatment revealing no demonstrable remains of the tumor tissue.

Treatment of Fibromas of the Nasopharynx. Gordon B. New, M. D., and F. A. Figi, M. D., Am. J. Roentgenol., 12:340-343, October, 1924.

IT is interesting to note that in the series of 32 cases upon which the authors based their conclusions, 23 had been previously operated on from one to twelve times before their examination in the Mayo Clinic. The average number of operations was between three and four. Some patients had been treated previously, and their treatments had consisted of internal medication, the application of caustics, fulguration and roentgen radiation. Two patients had been treated with radium. The conclusion of the authors is that radium is the treatment of choice for fibromas of the nasopharynx. With its use, the usual operative mortality in these cases is eliminated. In most of the cases of the series the tumor cleared up entirely and in the others it was held in check during its period of activity.

Carcinoma and Sarcoma of the Esophagus: A Plea for Early Diagnosis. Chevalier Jackson, M. D., Sc. D., Am. J. Med. Sci., 169: 625-648, May, 1925.

IT was stated by the author many years ago that the mortality of malignant disease of the esophagus was, at that time, 100 per cent. Notwithstanding the great advances made in surgery of malignancy elsewhere in the body, the ultimate prognosis of esophageal cancer

remains the same today. There is every reason to believe, however, that the reason for this is that the surgeons have never had a chance to develop the technique of a curative operation because the diagnosis is never made early. The reason why the diagnosis is never made early is that the textbook and journal articles give chiefly or exclusively diagnostic methods that *are always negative early* in the disease. When the time comes in which esophagoscopy shall be resorted to promptly on the appearance of certain very vague symptoms there is ample justification for the belief that the surgeon will cure a good percentage of patients. It is suggested by the author that the internes should in eliciting the history always inquire into the possibility of any previous dysphagia or difficulty in swallowing, and that in all printed history sheets questions to this effect should be inserted. By this means opportunities for early esophagoscopic diagnosis would be afforded and many diagnostic errors would be eliminated.

There are two means by which an early diagnosis of malignancy of the esophagus can be made early, namely: (1) Roentgen ray examination, and (2) esophagosocopy. All other means are late, inconclusive, and some, such as the passage of bougies, are dangerous.

By esophagoscopy, endoesophageal cancer can be diagnosticated not only early, but with the absolute certainty essential to getting the consent of a comparatively well man to an operation he may not survive. Endoesophageal cancer can be diagnosticated just as early, just as quickly and just as certainly as cancer of the cervix if an opportunity for esophagoscopy is afforded early. This can be accomplished by the roentgen ray.

As to treatment, the author states that the resection of the esophagus is to be advocated until some unknown method of treatment shall have been discovered. Palliatively an early gastrostomy to avoid mechanical irritation by food is to be tried. Radium has been useful in some cases; and in the experience of the author, in inoperable cases, together with an early gastrostomy, a varied well balanced diet by tube, plenty of water by mouth, and deep roentgen ray treatment prolongs the life of the patient.

The Normal Movements of the Stomach. E. D. M'Crea, B. A. M'Swiney, J. W. Morison and J. S. B. Stopford, Brit. J. Radiol., 30: 48-67, February, 1925.

THERE are two individual schools founded on the conception of normal gastric movements noted in animals and man. The first and oldest school believes that a typical gastric movement consists of two distinct phases —a peristaltic wave which involves the body of the stomach and the pre-antral region, and a contraction of the musculature of the pyloric antrum as a whole. The second school maintains that the peristaltic wave sweeps from its origin in the body of the stomach to the pylorus and does not partition the stomach.

The observations made by the authors by means of the fluorescent screen were as follows: Peristalsis was observed almost immediately and food began to leave the stomach in a few minutes. The normal stomach emptied completely in four to five hours. The type of contraction observed corresponded to the shape of the stomach.

1. In a normal J-shaped stomach fine, shallow waves could be seen close up to the incisura cardiaca on the lesser curvature, with more marked corresponding waves on the greater curvature. Increasing in depth, they progressed toward the pylorus, ending in the region of the pyloric antrum, a well-formed spherical part of the stomach which exhibited rhythmical concentric contractions and was often completely separated from the body of the stomach. If the pyloric antrum is completely separated from the body of the stomach, then with each concentric contraction the antrum empties into the duodenum. Peristaltic waves were not seen passing over this type of pyloric antrum. On the other hand, if the pyloric antrum was not completely separated from the corpus, then the contents might not pass into the duodenum, but were returned into the body of the stomach. In this type fine waves could be seen on the antrum.

2. In the "Steerhorn" stomach, situated high up and lying obliquely across the abdomen, the pyloric antrum was small and tubular in form. It was never completely separated from the corpus. Its concentric contractions were not so marked, and the peristaltic waves could be seen passing right up to the pylorus.

The number of peristaltic waves visible to the eyes of the observers varied markedly. The time taken to complete one wave was approximately twenty seconds.

There does not appear from the observations of the authors to be any definite rela-

tionship between the opening of the pylorus and the peristaltic movements.

A Case of Gastrectomy for Carcinoma of the Stomach. Cecil P. G. Wakely, F. R. C. S., Brit. J. Radiol., 30:41-48, Feburary, 1925.

THE author presents a typical case history of a patient suffering with carcinoma of the stomach involving the greater curvature and occluding the pyloric orifice. The stomach was so extensively invaded by the growth that no place could be found where a gastro-enterostomy could be performed. A complete gastrectomy was performed, after carefully ligating the coronary artery. Convalescence was uninterrupted. The patient was carefully observed by barium meals and the progress noted. For two years the patient lived in good health, without suffering from any organic symptoms. At autopsy a thickened, distended jejunum was observed, otherwise normal except the evidence of development to meet the demand. The liver was markedly enlarged and the patient had passed away due to secondary metastases in the liver.

The Visualization of the Biliary Tract: A New Method by Intravenous Injections of Tetrabrom-Phenolphthalein. Frank Smithers, M. D., and Richard B. Oleson, M. D., Illinois M. J., 47: 97-100, February, 1925.

DOCTORS Graham and Cole suggest a novel procedure whereby a dye, in nonpoisonous doses, injected into the venous blood, is shown to be excreted by the liver as a constituent of the bile. The drug possesses the property of rendering the biliary tract opaque to the x ray, so that it is possible to secure pictures whereby the visibility of the entire biliary tract is markedly enhanced. They suggest that, in general, patients receiving this dye may be expected to exhibit shadows outlining the biliary tract in direct proportion to the extent to which this tract is free from disease. The less pathology, the clearer the picture. The experience of the authors with this method would tend to confirm in all respects their published findings. No evidences of toxicity have been noted. The contentions of the original authors of the enhancement of the gallbladder's visibility would seem to be borne out by the experience of the authors; and in cases that have come to operation or to autopsy the findings when the body was opened have confirmed, in the experience of the authors, those previously suggested by this test.

The authors report one experience that might have already occurred to the originators of the method, but which they have not, at least as yet, mentioned in their published work. Shadows of a relatively slight intensity upon the roentgenological plate have been found to have been accentuated and more clearly brought out in a small photographic reproduction of this plate of the size ordinarily utilized in the manufacture of lantern slides. It is the desire of the authors to report this finding, hoping that it will serve as an advantageous procedure at times when dealing with extremely indistinct roentgenological shadows.

Etude Sur La Muqueuse Gastro-Intestinale Apres Gastro-Enteroanastomose. H. Hellmer, Acta Radiol., 14:32-43, March, 1925.

THE writer gives an account of some observations of the mucous membrane formation in the neighborhood of gastroenteroanastomoses. Roentgen examinations have been made of 35 patients on whom resection with gastroenterostomy or only gastroenterostomy has been performed. In addition, five postmortem specimens of such patients have been studied. Eleven cases are described in detail and illustrated with roentgonegrams or drawings of the specimens respectively. In the pictures, the folds of mucous membrance of the stomach and small intestine are seen to have been rearranged to an essential degree in the neighborhood of the anastomosis. The folds in the stomach diverge toward the anastomosis and are often lying closer together and are higher than they usually are at the corresponding place of the normal stomach. The folds on the intestinal side show a tendency to collect in greater numbers near the anastomosis than in its surroundings.

On the basis of Forsell's opinion that the folds of mucous membrane manage, by active movements, to procure the fine regulation of the passage of food through the alimentary canal, the writer suggests the possibility that the demonstrated mucous membrane formations on either side of the anastomosis are produced by active movements of the mucous membrane.

The writer emphasizes further that his investigations may possibly justify the supposition that a high grade spastic condition of the muscularis mucosa in certain cases can produce obstruction of the passage through the anastomosis.

Acute Ulcerative Colitis. PAUL H. ROWE, M. D., J. Lancet, 45:30-33, January, 1925.

ULCERATIVE colitis is a term used to denote any primary ulceration of the colon due to amebic or bacillary dysentery, tuberculosis, syphilis, typhoid and paratyphoid, diverticulitis, malignancy, scybala, chemical toxins and uremia and any secondary ulceration caused from exogenous pathology. The chief aids in the diagnosis are the history of the onset of the bloody diarrhoea, the sigmoidoscope and the x ray. An x ray examination shows the extent of the involvement and the points of constriction can be demonstrated in those cases where the sigmoidoscope is inadequate. This examination should be done with a barium clysma, when a rapid-filling, narrow tube-like colon without haustration will be observed. If, however, the ulceration is limited to the rectum and sigmoid, the x ray is of little assistance.

Iodized Oil as a Pyelographic Medium. C. H. NEUSWANGER, M. D., J. A. M. A., 84:1816, June 13, 1925.

THE author reports a preparation which appears to offer a pyelographic medium that is almost completely opaque to the roentgen ray, nontoxic and entirely without untoward effects when injected into the renal pelvis. A more detailed report is promised by the writer.

Radiation in the Treatment of Carcinoma of the Uterus. ERNEST C. SAMUEL, M. D., and ELEAZAR R. BOWIE, M. D., Am. J. Roentgenol., 12:370-372, October, 1924.

OF the 219 cases which have been treated by the authors since 1916, 22 are living and apparently free from the disease, 175 improved temporarily—as a rule from six months to two years—18 have been lost track of, and 179 are dead. These cases which have been given radiation treatment have *always* been received when they are in the advanced type where surgery had nothing to offer or where surgery had first had its chance and, after failure, radium was called upon to accomplish that which the scalpel was unable to do.

Intraperitoneal Insertion of Buried Capillary Glass Tubes of Radium Emanation in Carcinoma of the Cervix Uteri. ISAAC LEVIN, M. D., Am. J. Roentgenol., 12:352-357, October, 1924.

IN the consideration of the treatment of cervical carcinoma, one fact is self-evident—the more extensive the involvement of the broad ligaments, the other pelvic structures and regional lymph glands, whether the treatment be by surgery or radiation, the poorer the prognosis. Surgical removal invariably fails in all of these advanced cases, since the dissection must be done within an area infected with cancer cells and serves only to disseminate these cells through the opened lymph and blood channels. The failure of the present methods of radiotherapy, on the other hand, is attributed to the fact that the radiations do not reach with the necessary intensity into all the distant areas involved in the process.

"For the past two and a half years, Dr. Seeligmann and the writer have treated all cases of carcinoma of the cervix either by radiotherapy alone or by combination of radiotherapy and surgery. Different methods were tested and finally the following general scheme was followed: A thorough examination of the patient is made and if it is determined that the carcinoma is confined to the cervix and to the vaginal wall then radium emanation capillaries are inserted through the vagina, and this is followed by a course of high voltage roentgen therapy. In cases in which the broad ligaments are involved and there are fixed pelvic masses palpated, a laparotomy is performed. The patient is placed in a Trendelenburg position and the capillaries are inserted into carcinomatous tissue wherever it is found, *i. e.*, the broad ligaments, the spaces between the bladder and rectum, into the regional lymph nodes and also into the supravaginal portion of the cervix. The operation, as stated above, is in some cases followed by a severe reaction with high fever, which generally subsides in a few days. In other cases no reaction follows the intraperitoneal insertion of the capillaries and the patients make an uneventful recovery. The presence or absence of reaction does not depend upon the extent of the growth or the amount of radium emanation used and is due to a combination of bacterial infection and radium reaction. After the patients have recovered completely from the effects of the operation they receive a course of high voltage roentgen therapy."

Massive Dose Radium Treatment in Carcinoma of Cervix Uteri. GEORGE A. LELAND, JR., Am. J. Roentgenol., 12:373-378, October, 1924.

THE following points are emphasized by the author:

1. Massive dose unscreened radiation is effective in eradicating carcinoma of the cervix. The maximum curative action of radium is thus obtained because of its immediate contact with the malignant tissues which are to be destroyed.

2. Massive dose unscreened radiation has been found at this clinic to be more effective, quicker and less debilitating to the patient than intermittent screened gamma radiation. The latter is now used only in those cases where palliation by surface healing is the objective.

3. The likelihood of fistula formation is not greater in unscreened radiation than in screened gamma radiation.

4. The adjunctive procedures of cauterization and external radiation have not been found to be of sufficient value to be used as routine.

The Treatment of Inoperable Cancer of the Cervix by Radium. Albert Soiland, M. D., Am. J. Roentgenol., 12:378-382, October, 1924.

THIS presentation is limited to the inoperable cases who sought relief by other than surgical means. The theory upon which the author based his treatment is that "radiation to be effective.....in our attempt to checkmate the ravages of an extensive carcinoma frequently involving the uterus, the adnexa, bladder and rectum.....has to be used to the limit of toleration of whatever normal tissues may exist in this environment."

In this clinic unscreened radium is never permitted in any field where there is danger of invading healthy mucous membranes. Fifty to one hundred milligrams is used for each application filtered with the usual 0.5 millimeters of silver, one millimeter of brass and one or two millimeters of rubber. Three thousand milligram hours, which he refers to as the minimum efficient amount, was usually sufficient to thoroughly sterilize a given limited cancer field under such screening.

From experience in the past few years with a considerable number of patients with pelvic cancer and having already seen several inoperable hopeless cases pass the five year cure period, the author believes that radiation has made a step beyond that of any other method of combating carcinoma of the pelvis.

Final Results in the Treatment of Carcinoma of the Uterine Cervix at "Radiumhemmet," Stockholm. James Heymen, M. D., Am. J. Roentgenol., 13:158-161, February, 1925.

THIS paper deals with a discussion of the results obtained under the treatment of radium to carcinoma of the uterine cervix during the period from 1914 to 1921, inclusive.

The results with the radium treatment were obtained with a very small primary mortality. The author reports only having lost six cases out of 505 treated, or only 1.9 per cent, through peritonitis or sepsis.

In a considerable number of inoperable cases clinical healing was secured which persisted for at least five years. Of the remaining inoperable cases, an average of 20 per cent remained symptom free three years after the commencement of treatment.

In the majority of cases treated by radium, although a complete absence of symptoms were not secured, a more or less lasting improvement was obtained which was of the utmost importance to the patient.

"Radiological methods of treatment probably still have great possibilities of further development. But, on the other hand, it must be emphasized that to ensure a good result the radium treatment, as well as the surgical treatment, requires a strict planning, a technique carefully carried out and a fair share of experience. In the hands of the inexperienced it is attended with great risks without affording any chances of obtaining results comparable with those that can be obtained by the operative treatment."

The Present Status of the Treatment of Uterine Fibroids. Frank Benton Block, M. D., F. A. C. S., Therap. Gaz. 49:309-312, May, 1925.

IN a series of 153 cases in which radium was applied to uterine fibroids, 84.3 per cent of the patients were over forty-one years of age. Menorrhagia was by far the most important symptom, with backache, metrorrhagia and leucorrhea much less frequently present. In only one case were pressure symptoms present. Of the 153 cases, in 98 only radium was applied, in 45 some plastic surgery on the perineum or cervix was performed in addition to the radium application. In 8 other cases a vaginal myomectomy was performed before the radium was inserted, while in 2 others there was an abdominal operation coincident with the radium application. Of the 92 cases (60.1 per cent) traced, the menses stopped in 73 and continued in 19. Eighty-two cases or

89.1 per cent were cured, 2 were improved but not entirely relieved, 6 patients or 6.5 per cent required subsequent hysterectomy and 3 patients or 3.2 per cent required a second irradiation. The mortality in the series was nil. Two cases were subjected to x ray therapy exclusively. One of these has been traced and has a satisfactory result. In two other cases, a sarcoma of the uterus and a carcinoma of the ovary, x ray was used supplementary to operation.

From the above data, the opinion of the reader cannot vary so far from the conclusion of the author: The treatment of uterine fibromata should be undertaken only by those who are thoroughly familiar with the operative as well as the irradiation method of treatment. The mortality of radium irradiation in properly selected cases is nil and satisfactory results will be obtained in about 90 per cent of the cases after one treatment. The mortality of uncomplicated uterine fibroids subjected to operation is rapidly approaching the vanishing point and is nil in this series, while the end results of the operation are satisfactory in about 95 per cent of cases. In the experience of the author the mortality and morbidity of fibroid tumors of the uterus are usually due to complicating lesions.

Diathermy in Lobar Pneumonia. HARRY EATON STEWART, M. D., Am. J. Electroth. & Radiol., 43:49-56, February, 1925.

NO cure for pneumonia has yet been found and demonstrated to the satisfaction of the medical profession. Pneumonia is a disease which attacks the young and rugged, as well as the aged and infirm, for the cure of which no specific has yet been discovered. It is a disease in which no immunity is developed, and one in which the serology is as yet of an uncertain value.

Experience has taught caution to the medical profession in placing faith in any one method of treatment for a disease until it has been adequately and scientifically proved as beneficial. Innumerable methods have been tried and discarded in an attempt to lower the heavy mortality incident to lobar pneumonia.

Clinical investigation of the effect of diathermy in lobar pneumonia offers certain advantages:

1. It is available wherever electricity is installed.

2. It requires no cumbersome or very expensive apparatus.

3. The technique of its application, while exacting, is neither very difficult nor very complicating.

4. Not a single untoward effect has followed the giving of some 1,900 treatments reported to date. We may, therefore, feel assured that, properly given, it is absolutely safe.

5. No other part of the entire treatment regime of the patient, even including the use of serum, need be postponed or contra-indicated when diathermy is employed.

6. Unlike certain other medical and clinical procedures, it has not proven its value almost wholly in the hands of one individual or institution. The writer states that a number of his co-workers have obtained a lower mortality in their treatment of their cases than he has of his own (which has been 13.6 per cent in the treatment of some 245 cases).

In the application of the diathermy from the bipolar high frequency d'Arsonval current, flexible composition 22 gauge metal electrodes are used. For use over a single lobe plates about 5 by 7 inches are applied to the chest and back. In treating two adjacent lobes, one lung, or both bases, larger electrodes are used to include the entire area. The size of the electrodes is determined by the size of the area under treatment. The preparation of the electrodes consists in warming them thoroughly and covering them with hot soap lather, to insure a good contact and the development of no Faradic current. The electrodes are held firmly in position.

With everything in readiness the current is turned on slowly and gradually, employing about five minutes to reach maximum of 1,400 to 2,000 milliamperes. This maximum may be maintained for twenty to thirty minutes, and then slowly turned off. In very severe cases treatment may be repeated every four hours. In the usual case two to three treatments in twenty-four hours are sufficient. In the treatment of children the size of the chest should determine the proper electrodes to choose, and a current of not over 50 milliamperes per square inch of the electrode surface should be given.

Juvenile Tuberculosis. C. PIRQUET, Wien. med. Wchnschr., Jan. 3, 1925.

THE author is of the opinion that the vast majority of Viennese children have tuberculosis before the end of school. There is on an average 5 per cent of the children freshly

infected each year, so that 25 per cent of the children under five years and 60 per cent under twelve years are tuberculous. These figures should be much lower in the countries with higher sanitary conditions.

The prognosis depends upon the age of the patient, the extent of the infection, the localization of the focus and the nutrition of the child. When infection occurs within the first six months of life the outlook is hopeless. During the school age the outlook is much better, but becomes more doubtful at the onset of puberty. Meningeal involvement is always fatal, bony and lymphatic involvement is rarely primarily fatal, while pulmonary involvement is a factor of uncertainty—being subject to remissions and exacerbations and influenced considerably by puberty. The health and general nutrition of the child is an important factor. A good appetite, fresh air, rest and plenty of sunshine are the requisites for the battle against this infection.

Bronchial Gland Tuberculosis. JOHN B. HAWES, 2nd, M. D., and ELI FRIEDMAN, M. D., Boston M. & S. J., 192:954-956, May 14, 1925.

THE authors rightfully state their viewpoint in the following manner:

1. There is at the present time an amazing difference of opinion among x ray men and between roentgenologists and clinicians as to the interpretation of x ray shadows of the hilus region in children. There is an apparent unanimity of opinion as to what constitutes normal and abnormal, tuberculous and nontuberculous, active and inactive, old and recent. This is a most unsatisfactory state of affairs and one that should not be allowed to continue. We would call this situation to the serious consideration of the roentgenologists of this country.

2. We believe that there is urgent need of further study as to the effect of acute nontuberculous respiratory tract infections upon the hilus glands and tissues from both the clinical and roentgenological aspects.

3. We are of the opinion that both the d'Espine's sign and the Eustace-Smith sign are of comparatively little value; further, we believe that so-called parasternal dullness is a point of no value and that paravertebral or interscapular dullness are of value chiefly in the hands of those very few whose skill in percussion is highly developed. We agree that in the case of children who are actually sick with tuberculosis and are not merely infected contact cases with paravertebral dullness may be of real value in diagnosis.

4. The whole subject of diagnosis of bronchial gland or hilus tuberculosis is still in a stage of doubt and uncertainty. "Signs" at the best are unreliable and x ray evidence at present is of little value. Diagnosis should be based on history, exposure, positive Von Pirquet and constitutional signs and symptoms.

Significance of a Hemoptysic Onset in Tuberculosis. F. B. TRUDEAU, M. D., J. A. M. A., 84:1800-1801, June 13, 1925.

THE frequency with which pulmonary tuberculosis is ushered in by hemoptysis as a first symptom is a fact which has presented itself to the author whose work lies in the field of chest diseases. The previous history usually states that the patient up to the time of the hemorrhage was in apparently good health. It is best, in the mind of the author, to treat these patients as tuberculous until proved otherwise.

It is to be remembered, however, that in the group of cases with which this study deals the diagnosis of tuberculosis had previously been made by at least one physician, or the patient would not have been sent to the sanatorium for treatment. These cases are, therefore, not so apt to include those patients seen in the general hospital who enter because of tuberculosis and in whom nothing definite can be found to account for the bleeding.

In this study of 245 patients entering the Trudeau Sanatorium in Saranac Lake, New York, between the years 1911 to 1922 and having hemoptysis as the first symptom, the author finds:

1. Only 10, or 4 per cent, failed to show other evidence of tuberculosis.

2. One hundred and forty-nine, or 60.81 per cent, had a positive sputum, either while in the sanatorium or prior to the entrance.

3. One hundred and seventy-one, or 69.83 per cent, had definite parenchymatous findings.

4. In 196, or 80 per cent, persistent rales were found in the upper portion of the chest.

5. Ten, or 4.08 per cent, had had at some time pleurisy with effusion, or had developed this condition while in the institution.

6. The prognosis of this type of case is no better or worse than in any other mode of onset of this disease.

Roentgenuntersuchung der Lunge Nach Injektion von Lipiodol in die Bronchien. S. Keijser, Acta Radiol., 14, 58-60, March, 1925.

THE writer reports of the great advantages of lipidol injections into the bronchi of patients suffering from bronchiectasis.

Eventration of the Diaphragm, With a Report of a Case Emphasizing the Value of the Movements of the Costal Margins in Diagnosis. Edward C. Reifenstein, M. D., Am. J. Med. Sci., 169:668-678, May, 1925.

A CASE of eventruation of the diaphragm is reported. The author carefully reviews the literature as to the various theories of its causation, pathological anatomy, symptomatology and diagnosis. Heretofore the condition has only been recognized roentgenologically; but, since very few patients, comparatively, who appear for diagnosis and treatment are subjected to a complete roentgenological examination, the author believes that some other method for the diagnosis of the condition should be considered. He offers in this article the possibility of the recognition of this condition by clinical means instead of, as is now done, by means of the roentgen ray. An important aid for the establishment of such a diagnosis is the careful study of the movements of the costal margins, as first described by Hoover.

Subphrenic Abscess. Jacob K. Berman, M. D., J. Indiana State M. A., 18:217-221, June, 1925.

EARLY and accurate diagnosis is most important, in view of the serious complications that may ensue. A differential diagnosis between subphrenic abscess and pneumonia is hard. The best aids are careful history, the exploratory needle and the x ray. In most of the cases the x ray showed an elevated diaphragm and usually gas below the diaphragm. Treatment naturally depends upon the accuracy of the diagnosis.

BOOKS RECEIVED

This column is devoted to the acknowledgment of the books received. Such acknowledgment must be regarded by the sender as sufficient recognition of the courtesy until time and space permit selections to be made for review.

X-Ray Atlas of Normal and Abnormal Stuctures. A series of radiograms illustrating the normal and abnormal structures of the body, and the more common injuries and diseases. By *Archibald McKendrick,* F. R. C. S. (Edin.), D. P. H., F. R. S. E., Surgeon-in-Charge of the Surgical X Ray Dept., Royal Infirmary, Edinburgh Examiner, Royal College of Surgeons, Edinburgh, and *Charles R. Whittaker,* F. R. C. S. (Edin.), F. R. S. E., Assistant Lecturer in Anatomy, Surgeons' Hall, Edinburgh Examiner, Royal College of Surgeons, Edinburgh. Cloth. Price $10.00. Pp. 222, with 388 illustrations and 25 diagrams. New York: William Wood & Company, 1925.

The International Medical Annual. A year book of treatment and practitioner's index, published for the 43rd year. By 31 eminent specialists and leaders in the medical profession. Edited by *Carey F. Coombs,* M. D., F. R. C. P. (Medicine), and *A. Rendle Short,* M. D., B. S., B. Sc., F. R. C. B. (Surgery). Cloth. Price $6.00. Pp. 566, with 43 plates, many in colors, and 87 other illustrations. New York: William Wood & Company, 1925.

Physical Diagnosis of Diseases of the Chest. A treatise written in the hope of utilizing the experience gained in the instruction of medical officers in physical diagnosis at the Medical Reserve Officers' Camps during the World War. By *Joseph H. Pratt,* A. M., M. D., and *George E. Bushnell,* Ph. D., M. D. Cloth. Price $5.00. Pp. 522, with 166 illustrations. Philadelphia: W. B. Saunders Company, 1925.

Dental Drawing. A text whose object is not to produce artists but to develop the student's and practitioner's ability for drawing, and by drawing tooth form to teach dental anatomy. By *Edward Drosen,* D. D. S., Head, Department of Dental Drawing, Marquette University College of Dentistry. Stiff Card. Pp. 83, with 18 illustrations and 22 full page plates from original drawings by the author. New York: Dental Items on Interest Publishing Co., 1925.

BOOK REVIEWS

Radiographs of the Bones and Joints. A. P. Bertwistle, M. B., Ch. B., Leeds, Resident Surgical Officer, General Infirmary, at Leeds. Cloth. Price $5.00. Pp. 198, with 299 illustrations. New York: William Wood & Co., 1924.

This descriptive atlas has been especially compiled by the author to provide students and practitioners with a handy book of reference for the interpretation of the radiographs which are becoming increasingly more useful and essential for accurate diagnosis.

The silhouette radiographs used in the *Atlas*

add to the ordinary shadow radiograph of bone the contour of the limb or other soft parts. Further enhancing the bony definition and giving the prints more complete appearance is the addition of the black backgrounds. These features impart a much needed reality and aid materially in the ease of interpretation.

The text has been divided into six parts, the plates and their legends being grouped as follows:

I. *The Process,* comprised of 12 illustrations wherein the author demonstrates step by step the method by which the silhouette radiographs are prepared.

II. *Normal Bones and Epiphyses,* the 46 plates having been taken from subjects ranging from one to nineteen years.

III. *Fractures,* the most extensive section of the Atlas—88 plates being used to adequately portray this important diagnostic subject;

IV. *Diseases of Bones,* the author never offering more than two of the 75 plates to demonstrate a given pathological condition.

V. *Injuries and Diseases,* 55 plates being shown with emphasis being placed upon dislocations, tuberculous and Charcot's joints.

VI. *Miscellaneous,* a section wherein 23 conditions are portrayed which did not readily fall into the other classifications—special reference being given to congenital deformities.

The first part of the *Atlas* contains plates of the normal bones and epiphyses, and these are arranged on the left-hand pages. The pathological conditions, constituting the last four sections of the text, are arranged on the right-hand pages. With this arrangement the normal and pathological conditions can be readily compared.

Every detail has been carefully considered in the compilation of this *Atlas,* rendering it a practical aid to those interested in the subject of radiography as a book of reference.

International Clinics. A quarterly illustrated clinical lectures and especially prepared original articles. By leading members of the medical profession throughout the world. Edited by *Henry W. Cattell,* A. M., M. D. Volume IV. Thirty-fourth Series. Cloth. Price, $2.50. Pp. 208, with 95 illustrations. Philadelphia: J. B. Lippincott Company, 1924.

In considering the value of such an organized volume to the individual practitioner, this can only be obtained by a careful consideration of the subject matter at hand and these recognized leaders of the medical profession who act as contributors of these articles.

The contents are grouped under six headings:

I. *Diagnosis and Treatment of Certain Disease Entities.*

(a) *Blastomycosis.* Major James F. Coupal, M. C., M. D., Washington, D. C.

(b) *Granuloma Inguinale.* Foster M. Johns, M. D., and I. M. Gage, M. D., New Orleans.

(c) *Food Factor in Pellagra.* Seale Harris, M. D., Birmingham, Ala.

(d) *Vincent's Angina.* Matthew W. Perry, B. S., M. D., Washington, D. C.

(e) *Clinical and Bacteriological Analysis of Bacillary Dysentery Cases.* Roland C. Conner, M. D., and Lewis B. Bates, M. D., Ancon, Canal Zone.

(f) *Quinine in Acute Malaria.* N. P. MacPhail, M. D., Quirigua, Guatemala, Central America.

(g) *Results of Noguchi Treatment and Prophylaxis for Yellow Fever.* Lieutenant-Colonel James Cean, H. D., Belize, British Honduras.

II. *Diagnosis and Treatment.*

(a) *Intestinal Obstruction.* Sterling Bunnell, M. D., San Francisco.

(b) *Eczema.* H. H. Hazen, M. D., Washington, D. C.

(c) *Periodic Health Examinations.* Elliot B. Edie, M. D., Connellsville, Pa.

(d) *Use of X Ray and Radium From Standpoint of Clinical Surgeon.* Albert J. Ochsner, Chicago.

III. *Medicine.*

(a) *Insulin.* F. G. Banting, M. D., Toronto, Canada.

(b) *Acute Pancreatitis Successfully Operated.* Frederick Christopher, M. D., F. A. C. S. Chicago.

(c) *Syphilis of the Thyroid Gland.* Ernest Schulmann, M. D., Lyons, France.

(d) *Calcification of the Pericardium.* Henry H. Turner, M. D., Louisville, Ky.

(e) *Clinical Classification of Congenital Cardiac Disease.* Maude E. Abbott, M. D., Montreal, Canada, and Wilfrid T. Dawson, B. A. (Oxon), Philadelphia.

IV. *Pediatrics.*

(a) *Effect of Tonsillectomy on Existing Visceral Disease.* Alfred Hand, M. D., Philadelphia.

(b) *Mental Disease in Infancy and Childhood.* James Burnet, M. A., M. D., F. R. S. P. (Edin.), Edinburgh, Scotland.

V. *Surgery.*

(a) *Internal Fixation in Fractures.* E. L.

Eliason, A. B., M. D., F. A. C. S., and Drury Hinton, M. D., F. A. C. S., Philadelphia.

(b) *Ethylene.* Paluel J. Flagg, M. D., New York City.

(c) *Fractures of the Lumbar Spine.* Carl Da Costa Hoy, A. M., M. D., F. A. C. S., Columbus, O.

VI. *Industrial Medicine.*

(a) *Practical Application of Industrial Medicine.* Leland E. Coper, M. D., New York City.

Physical Diagnosis of Diseases of the Chest. By Joseph H. Pratt, A. M., M. D., and George E. Bushnell, Ph. D., M. D. Cloth. Price $5.00. Pp. 522, with 166 illustrations. Philadelphia: W. B. Saunders Company, 1925.

This text is the result of the experience gained in the instruction of medical officers in physical diagnosis during the late war. The object of the text is to give to the student in a comprehensive manner the fundamental principles of the art of physical diagnosis and to induce the student to familiarize himself with the advantages and application of his five senses.

The subject matter of the text has been divided into two parts; the first, on diseases of the lungs, is organized by George E. Bushnell. The second, on diseases of the heart, is the work of Joseph H. Pratt.

In the study of this work, it is suggested that the student first familiarize himself with the essentials of physical diagnosis and master the art of inspection, palpation, percussion and auscultation, so aptly considered in the first portion of the text. The mastery of these basic principles can only be attained by incessant study in small groups or with healthy subjects upon normal chests, carefully noting the appearance, feel, characteristics of the breathing and of the percussion note of the healthy chest with all its local variations. A chapter is inserted which treats with the physics and physiology of the thorax and applies the laws of sound and its transmission to the various conditions encountered within the cavity. This chapter is valuable to the student in order to realize an understanding of the variations encountered. After familiarizing the reader with the characteristics of the healthy chest, the authors carefully study the elements leading to the diagnosis of the individual diseases of the thoracic organs. Particular stress is given pulmonary tuberculosis, not only because of the complexity and importance of the disease, but also because those who are victims of the disease furnish an inexhaustible material for the study of physical diagnosis, and after one has mastered the diagnosis of pulmonary tuberculosis in all its forms, the diagnosis of other diseases of the lungs is comparatively easy.

The same essential arrangement has been utilized in the second portion of the text. In realization of the necessity of an understanding of the functions of the heart as a prerequisite to the intelligent study of physical diagnosis of the organ, the writer devotes the first portion of his work to its consideration. Here the fundamentals of the physiological action of the heart and circulation are discussed in relation to the anatomical structure of the heart and its surrounding structures. Having established the foundation for study by reviewing its physiological function, the principles of physical diagnosis are related to the normal and pathological variations. A third chapter is devoted to the instrumental methods employed as aids to the physical diagnosis of diseases of the heart. Here the technique of sphygmomanometry is discussed, along with the value of the sphygmogram, phlebogram, electrocardiogram, orthodiagram, teleradiagram and spirometry. The question of cardiac irregularities, the interpretation of which has troubled the general practitioner, is adequately handled by the author. With a foundation of the requisites for the establishment of a diagnosis, a classification of the cardiac diseases, based upon an etiological, anatomical and physiological diagnosis, is given. For their individual consideration, diseases of the heart are discussed under the headings of diseases of the myocardium and heart valves, diseases of the pericardium, diseases of the greater vessels, and cardiac neuroses. The characteristic physical signs which aid or establish the diagnosis of these various conditions are carefully considered.

Throughout the entire text, the viewpoint constantly maintained is that of the clinician whose chief interest is the presentation of material and the recognition of the disease as it presents itself at the bedside and in the consulting room. In this one text, two subjects, each a life study in itself, have been so adequately handled by the individual authors as to receive without the least hesitancy the commendation of the Journal of Radiology in its presentation to the radiological profession as giving the necessary fundamental principles and the meat of problems of present day physical diagnosis of diseases of the chest.